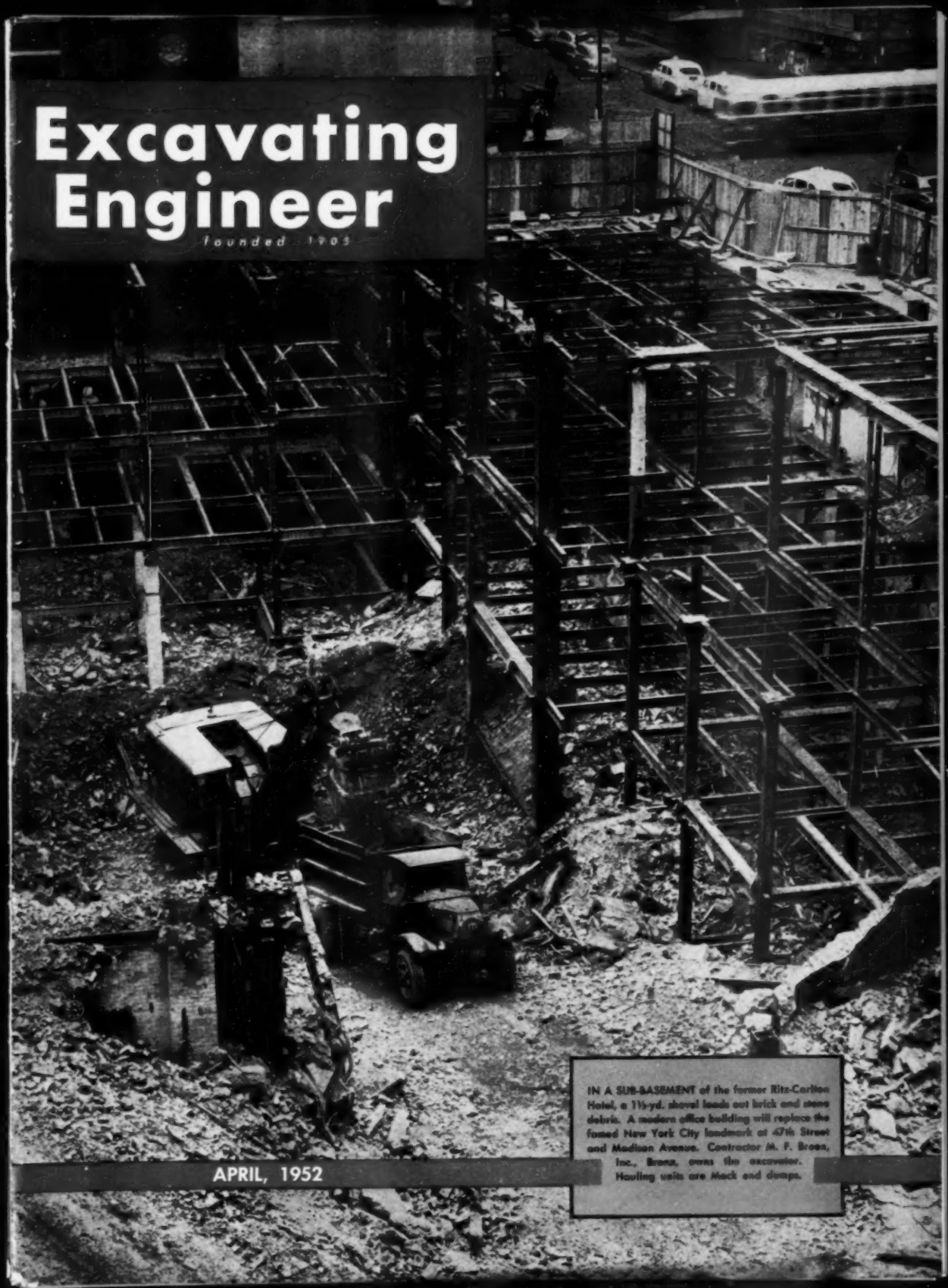
Excavating Engineer

Founded 1905



IN A SUB-BASEMENT of the former Ritz-Carlton Hotel, a 1½-yd. shovel loads out brick and stone debris. A modern office building will replace the famed New York City landmark at 47th Street and Madison Avenue. Contractor M. F. Brosa, Inc., Bronx, owns the excavator. Hauling units are Mack end dumps.

APRIL, 1952

Blade with "Backbone"

BUCYRUS ERIE

SOLID welded blade assembly . . . backs reinforced with flange beams, both top and bottom . . . special wear-resistant, alloy steel cutting edges . . . heat-treated, replaceable alloy steel corner shoes . . . welded box-section main frame — for extra strength Bucyrus-Erie Bullgraders have it, and then some.

WITH PRECISION BALANCE of bullgrader blade to the International Tractor, full tractor power is delivered to the blade. No front-heavy nosedown — no excess strain on tractor parts.

FROM ANY ANGLE full-front, side cast right, side cast left, tilt left, tilt right, the various Bucyrus-Erie Bullgrader blade positions can be changed easily—in a few minutes. No special tools needed.

IN ANY TYPE either cable or hydraulically controlled Bucyrus-Erie Bullgraders handle smoothly, easily, respond instantly, provide full visibility. Four hydraulic models, three cable sizes.

IT'S BUCYRUS-ERIE Bullgraders for day-in-day-out quarry duty on everything from shale to granite. Make them the backbone of your rock dozing outfits. See your International Industrial Tractor Distributor.

BUCYRUS-ERIE COMPANY
South Milwaukee, Wisconsin

304T51C

See Your INTERNATIONAL Industrial Tractor Distributor

designed- built- right- for flotation!

NEED a flotation tire you can depend on for free-rolling wheels? You've got it in Goodyear's huge, husky Earth Mover All-Weather giant. Rugged construction gives it outstanding dependability, while its nonclogging tread *adds* to its first-class performance. Result is maximum flotation and *First Choice* standing among profit-wise construction men.

You can't beat the Goodyear team for special-purpose tires

HARD ROCK LUG
Super-tough champ for all types of rock work

SURE-GRIP
Tops in traction on drive wheels of graders and pans

We think you'll like
"THE GREATEST STORY EVER TOLD"
Every Sunday — ABC Network

All-Weather, Sure-Grip—T.M.'s The Goodyear Tire & Rubber Company, Akron, Ohio

GOODYEAR

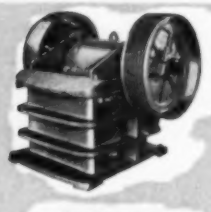
MORE TONS ARE HAULED ON GOODYEAR TIRES THAN ON ANY OTHER KIND

Look To LIPPMANN *For Complete*

Crushing, Washing, Screening Machinery

For 32 years Lippmann engineers have specialized in the design and construction of machinery and plants to produce crushed stone, sand and gravel. During that time they have earned the confidence of the industry to the extent that Lippmann equipment is the choice of many leading aggregate producers and contractors.

You, too, can look to Lippmann with confidence for the finest of equipment to meet your needs — for individual crushers, feeders, screens, washers or conveyors — or for complete plants. Lippmann Engineering Works, 4611 West Mitchell Street, Milwaukee 14, Wisconsin, U. S. A.



JAW CRUSHERS

Sizes up to 36 x 48 inches (the largest overhead eccentric jaw crusher made). Features 25% more crushing area, non-choking construction, maximum output, minimum power use and maintenance.

GYRATORY CRUSHERS

Revolutionary anti-friction gyratory operation with parallel shaft rotation results in lighter weight, less power consumption, reduced maintenance and controlled product size. Sizes 25 to 72 inches.

ROLL CRUSHERS

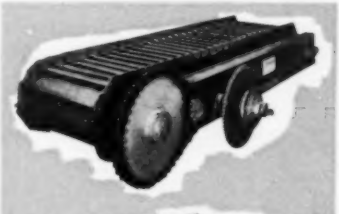
Offer real economy in secondary crushing. Exact product size control; tapered roller bearings; a variety of shell face patterns available; easily replaceable wear plates reduce maintenance. Sizes up to 72" x 24" rolls.

CONVEYORS

Complete line of both portable and stationary conveyors. Lippmann Life-Sealed ball bearing conveyor idlers are outstanding for lower first cost and maintenance. Ball bearings are lubricated for life.

APRON FEEDERS

LIPPMANN makes apron feeders and plate feeders to meet all feeding requirements. Every design has been thoroughly proven by rigorous field service and built for long wear and low power requirements.



SCREENS

Vibrating screen pictured is positive eccentric type with equally distributed vibration for maximum capacity. Vibration contained in screen body entirely. All sizes, single and multi-deck.

PORTABLE PLANTS

Portable washing plants, as pictured, combine scrubber, vibrating screen, sand drag, conveyors. Capacities up to 120 cu. yd. per hour. Lippmann also makes trailer and self-propelled crushing plants including screening and loading elements.

PULVERIZERS

An unusual design of hammer-type crusher with unmatched records of capacity, product size and quality control, low first-cost and ease of maintenance. Manganese hammers, forged hammer arms and other outstanding design features. Sizes up to 40" x 36".

LEW **LIPPMANN**

CRUSHERS FEEDERS SCREENS CONVEYORS ELEVATORS HOPPERS BINS

Advertisers
IN THIS ISSUE

Allis-Chalmers Mfg. Co. 18, 19
American Chain & Cable Co., Hazard Wire Rope Div. 35
American Hoist & Derrick Co. 46, 50
American Steel & Wire Div. 6, 7
American Steel Dredge Co., Inc. 69

Bucyrus-Erie Co. ..2nd Cover, 12, 13, 47, 67

Caterpillar Tractor Co. 59
Colorado Fuel & Iron Corp., Wickwire Spencer Steel Div., The ... 8
Columbia-Geneva Steel Div. 6, 7
Cooper-Bessemer Corp., The 14

Drake-Williams-Mount 69

Erie Steel Construction Co. 48
Euclid Road Machinery Co., The 38

For Sale (Classified) 71
Forke Bros. 70
Foster, L. B., Co. 52

General Electric Co. ..... 3rd Cover
Goodyear Tire & Rubber Co., The 1

Harnischfeger Corp. 9
Hayward Co., The 64
Hazard Wire Rope Div., American Chain & Cable Co. 35
Hercules Powder Co. 16

Ingersoll-Rand ..... 4th Cover
International Harvester Co. 36, 37

Jaeger Machine Co., The 43
John Trailer Div., Pressed Steel Car Co., Inc. 56
Johnson, C. S., Co. 41

Koehring Co. 40, 41

LaCrosse Trailer Corp. 51
Leschen, A., & Sons Rope Co. 45
LeTourneau, R. G., Inc. 10, 11
Lippmann Engineering Works 2

Macwhyte Co. 15
Marion Power Shovel Co. 55

Northwest Engineering Co. 5

Pekay Machine & Engineering Co. 65
Pressed Steel Car Co., Inc., John Trailer Div. 56

Rogers Bros. Corp. 49

Sauerman Bros., Inc. 61
Schield Bantam Co. 53

Tennessee Coal & Iron Div. 6, 7
Timken Roller Bearing Co., The 17

United States Steel Co. 6, 7

Wellman Engineering Co., The 63
Wickwire Spencer Steel Div., Colorado Fuel & Iron Corp., The ... 8

Excavating Engineer

founded 1905

CONTENTS

Volume XLVIII No. 4 **April, 1952**

Revive Rock Fill at Bear River — by Robert J. Green 20

Rock fill, the natural engineering masonry of Julius Caesar's time, is being revived in the dam construction business. At Jackson, Calif., and several other places in the west, private power companies are bringing back the art of rock fill masonry designs to get the most out of their investment dollars.

Sufficiency Ratings Alert Public to Highway Needs 28

With the U. S. road program falling behind traffic loads, a highway-condition "scoreboard" is needed to show at a glance where we stand. Sufficiency ratings, a recent development, can make highway needs easily seen by both officialdom and the driving public.

Caissons Solve Soil Problem 32

O'Neil and Kenny, joint venture contractors, supplement piles with caissons to solve soil problems and push completion of Veteran's Administration Research Hospital over "Chicago's Biggest Basement."

Block Path of Coal Fire 39

Colorado contractor, Paul Hunt Construction Co., cuts trench through coal bed, then backfills with clay to stop underground fire.

Hess Urges Preventive Maintenance — by Ray Day 42

Practical Safety Training for Small Organizations — by Chas. R. Zeskey, Jr. 44

Here are a few practical suggestions to make the small contractor's safety program more effective. This material was presented at the National Safety Council meeting.

News from the Field 46

Equipment Distributors Elect Hush 1952 President 46
Matches Promote Safety 46
Vice Presidents Named by Brown & Root Inc. 46
No-Injury Records Climb for Open Pit Operations 46
Venezuelan Superhighway Pushes Through Mountains ..48
Beckwith Machinery Names Two to Managerial Posts ..50
37,500 Feet of Drill Cores Stored in Unique Library ...50
A.G.C. Cites 120 Firms for Safety Records 50
Cunningham-Ortmayer Co. Gets New Owner 52
Expect 1954 to See Finish of New York Thruway 53
Award Foundation Contract for Kansas Dam 53
Focus Attention on Roads in State Capitals 54
Equipment Company's Staff Gets Field Exprience 56
Trencher Cuts 3½ Miles in Single Day 57

Obituary
Walter J. Mullally 48

Not in the Contract 58

Equipment You Ought to Know About 60

New Trade Literature 68

Notes from the Manufacturers 70

COPYRIGHT 1952 BY THE EXCAVATING ENGINEER PUBLISHING COMPANY

Regular Subscription (payable in advance): 35 cents per copy, $3.50 a year; Canada and foreign, subject to publication policy, $5.00 per year. Special subscription: Upon written request on company letterhead this publication will be sent free of charge to companies, executives and supervisors engaged actively in excavating. Occupation of subscriber must be given for all subscriptions, paid or special. Right is reserved to refuse foreign subscription. Indexed by Engineering Index, Inc. Volumes available on microfilm.

Published Monthly by

THE EXCAVATING ENGINEER PUBLISHING COMPANY

South Milwaukee, Wisconsin, U.S.A.

E. M. HEUSTON, Publisher
W. C. VAN DYKE, Editor
M. B. JAEGER, Managing Editor

H. A. BURKHARDT, Sales Manager
E. W. ARNDT, Art Editor
G. W. GRAF, Assistant Editor

CCA Member Controlled Circulation Audit

"At National Cash Register we believe . . ."

STANLEY C. ALLYN
President, National Cash Register Company

"At National Cash Register we believe a thrifty employee is a better employee and a better citizen. By providing the Payroll Savings Plan for U. S. Defense Bonds we help our employees practice the thrift habit and build up a backlog of savings for their future security. By buying Bonds they become shareholders in their country."

The employee who joins the Payroll Savings Plan becomes *a man with an objective*—a young fellow who realizes that the systematic purchase of Defense Bonds is a sure way to the down payment on a home . . . a father who wants to provide for Junior's college education . . . an older man, with an eye to retirement and personal security.

The man with an objective is a better employee. He knows that a day lost from work is just that much out of his take-home savings. He doesn't take chances—wants to stay off the accident list. He has a new realization that better work on his part will lead to advancement—and a larger monthly allotment for Defense Bonds.

The man with an objective is a better citizen, holds his head a little higher. He is buying a growing share in America . . . helping to combat inflation . . . making a real contribution to the defense effort.

These employee and *employer* benefits of the Payroll Savings Plan are reflected in the records of thousands of companies. Figures show that as employee participation in a Payroll Savings Plan grows to 60%, 70% or higher, absenteeism decreases, the "Lost Time Accidents" curve goes down and production goes up.

If 60% or more of your employees are not Men With Objectives, do something about it. Phone, wire or write to Savings Bond Division, U.S. Treasury Department, Suite 700, Washington Building, Washington, D. C., and your State Director, Treasury Department, will show you how to install a Payroll Savings Plan, or how to build an existing Plan.

During 1951, over 1,500,000 employed men and women joined the Payroll Savings Plan.

The U.S. Government does not pay for this advertising. The Treasury Department thanks, for their patriotic donation, the Advertising Council and

Excavating Engineer

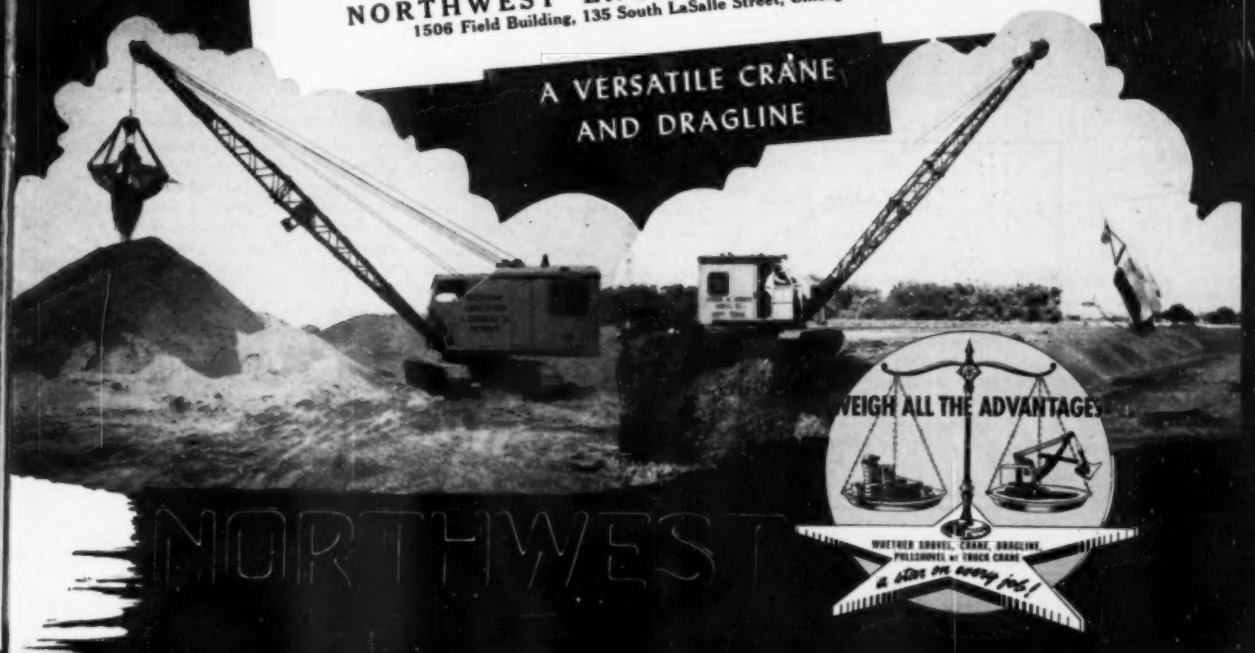
YOU can't get performance just by changing booms! Northwest pioneered convertibility in the days when a Shovel was only a Shovel and a Crane stayed a Crane. Real convertibility reduces investment, saves shipment costs and speeds up the job. Real Convertibility isn't a matter of just changing booms.

Northwest brings you a combination of advantages in the basic machine and attachments so balanced, that as a unit Northwest, whether operating as a Shovel, a Crane, a Dragline or a Pullshovel, makes possible lower cost operation, easier upkeep and greater output *at no greater first cost.*

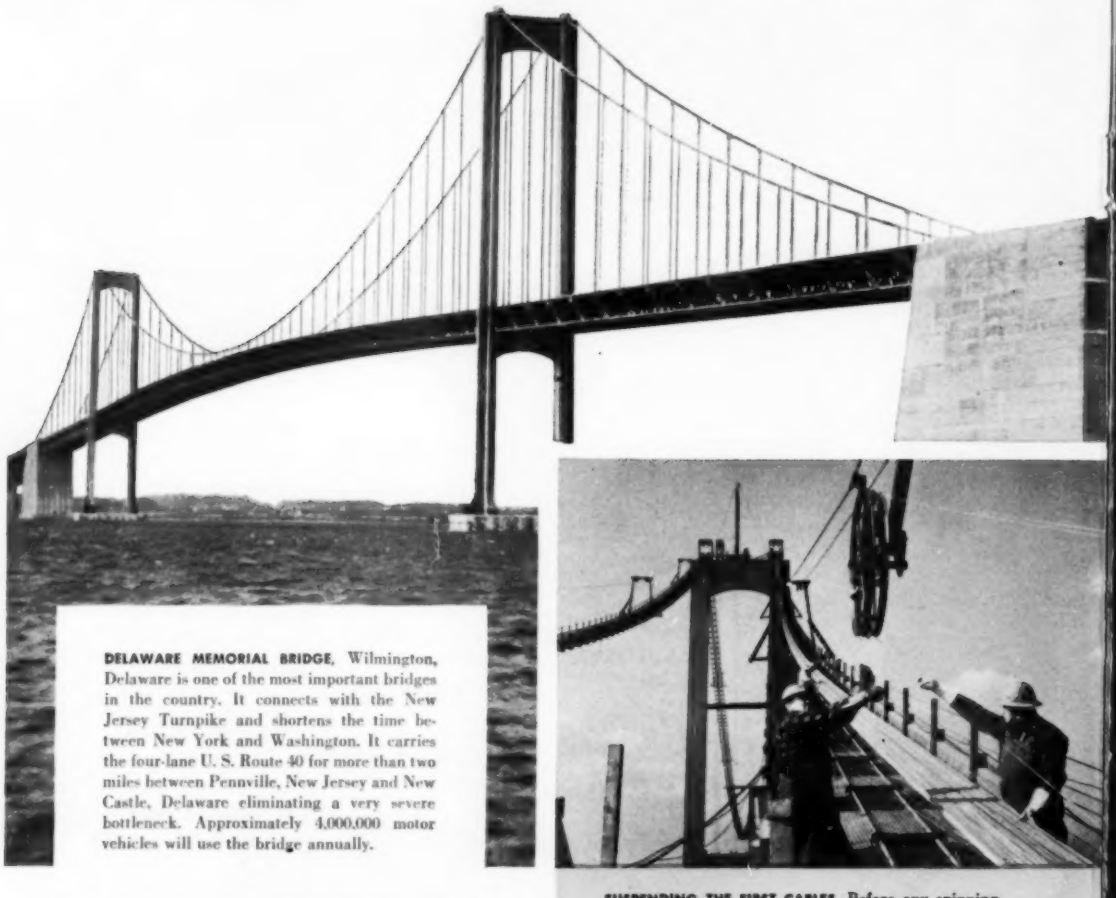
This is only one of the many reasons why contractors, both large and small, all over the country, have made one out of every three Northwests sold a repeat order.

Choose the best for the job! Why not plan to have a Northwest? It will pay you to place an order. Let's talk it over.

NORTHWEST ENGINEERING COMPANY
1506 Field Building, 135 South LaSalle Street, Chicago 3, Illinois



The bridge that raised itself



DELAWARE MEMORIAL BRIDGE. Wilmington, Delaware is one of the most important bridges in the country. It connects with the New Jersey Turnpike and shortens the time between New York and Washington. It carries the four-lane U. S. Route 40 for more than two miles between Pennville, New Jersey and New Castle, Delaware eliminating a very severe bottleneck. Approximately 4,000,000 motor vehicles will use the bridge annually.

Interesting Facts

Total length of bridge—10,765 feet
Length of Main Span—2,150 feet
Length of each suspended side span—750 foot
Height of towers above piers 417 feet—about equal to height of a 35-story building
Clearance of main span above water—175 feet
Size of main wire cables—19¼ inches in diameter
Size of wire rope suspenders—2 inches in diameter
Total length of suspenders—56,000 feet
Estimated weight of superstructure—73,141,500 pounds
Total estimated cost of bridge—$43,900,000

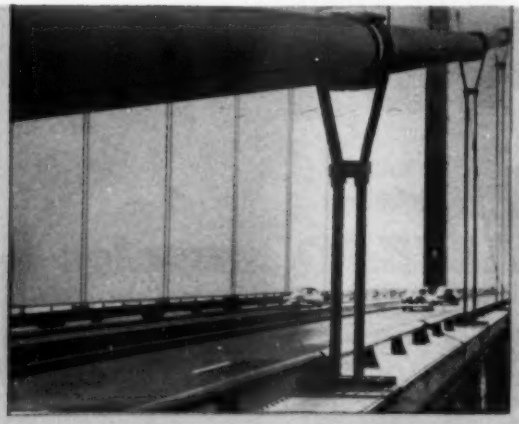
SUSPENDING THE FIRST CABLES. Before any spinning of the main suspension cables could begin, four 2-inch American Tiger Brand Wire Ropes were strung from anchorage to towers and from tower to tower. On these were placed Cyclone Chain Link catwalks with wire rope railings to provide safe footing for the workmen.

Next a wire rope tramway system was installed to carry the hauling cable for the spinning wheels. The photo shows workmen picking the individual wires from the spinning wheel to form the main suspension cable. The 436 wires in each strand of the main cable are, in reality, two continuous wires which are connected to the anchorage at both ends by means of eyebars. The end of the wire from each successive reel was spliced to the end of the wire from the next reel and the ends of the last pair of wires of the strand were spliced to the ends of the first pair. It took 19 of these strands to form each of the main cables.

by its own suspenders...

OR, HOW U·S·S TIGER BRAND WIRE ROPE HELPED TO BUILD AND SUPPORT THE WORLD'S 6th LONGEST SUSPENSION BRIDGE

IT'S QUITE A FEAT to build a two-mile long suspension bridge over deep water when the towers are as high as a 35-story skyscraper. But it's even more of a feat to use the wire rope suspenders for the original construction cable between towers, then take the same wire rope, cut it into proper lengths and use it again for the permanent vertical suspenders. It's like lifting yourself by your bootstraps. The photographs show how it was done.



56,000 FEET OF TIGER BRAND WIRE ROPE SUSPENDERS. These two-inch wire rope suspenders were made from the rope which was originally used to support the catwalks. This unique method of construction saved many thousands of dollars on the job. It was originated by the American Bridge Division of United States Steel Company and is now used in building most suspension bridges of this type.

BEAUTY IN STEEL. The Delaware Memorial Bridge represents the combined efforts of many different divisions of the United States Steel Company. The steel for spans and towers was made by the United States Steel Company, Cables and Wire Rope by American Steel & Wire Division, cement by Universal Atlas Cement Division and the bridge itself was erected by American Bridge Division.

AMERICAN STEEL & WIRE DIVISION, UNITED STATES STEEL COMPANY
GENERAL OFFICES: CLEVELAND, OHIO
COLUMBIA-GENEVA STEEL DIVISION, SAN FRANCISCO · TENNESSEE COAL & IRON DIVISION, FAIRFIELD, ALA., SOUTHERN DISTRIBUTORS
UNITED STATES STEEL EXPORT COMPANY, NEW YORK

U·S·S AMERICAN TIGER BRAND WIRE ROPE

Excellay Preformed

USS

UNITED STATES STEEL

in WIRE ROPE, too load strain calls for SPECIALIZED muscles

Everything looks upside down to the three-toed sloth. Unique among animals, he prefers to live his life dangling downward from the top branches of tall trees. Helping him to survive in his topsy-turvy world are highly specialized and powerfully developed rear and forelimb muscles.

In wire rope, too, specialized jobs call for the right kind of muscle. Load strain! Bending fatigue! Shock stress! Abrasion! Each calls for wire rope that best combines the required resistance characteristics.

Complete quality control from ore to finished rope; long experience and specialized know-how—these are your assurance that in Wickwire Rope you always get the proper combination of physical properties for long-lasting, reliable service on your particular job.

For additional information write or phone our nearest sales office.

THE COLORADO FUEL & IRON CORPORATION—Abilene (Tex.) • Denver • Houston • Odessa (Tex.) • Phoenix • Salt Lake City • Tulsa
THE CALIFORNIA WIRE CLOTH CORPORATION—Los Angeles • Oakland • Portland • San Francisco • Seattle • Spokane
WICKWIRE SPENCER STEEL DIVISION—Boston • Buffalo • Chattanooga • Chicago • Detroit • Emlenton (Pa.) • New York • Philadelphia

WICKWIRE ROPE
A CF&I PRODUCT

LOOK FOR
THE YELLOW TRIANGLE
ON THE REEL

WICKWIRE ROPE
CF&I
PRODUCT OF WICKWIRE SPENCER STEEL DIVISION
THE COLORADO FUEL AND IRON CORPORATION

triple play for profit

with P&H ELECTRIC SHOVELS

All three of these P&H Electric Shovels are at work for J. Robert Bazely at Pottsville, Pa. There are three sizes at work here — 4, 5 and 6 cu. yds., all delivering steadily at rock bottom costs.

P&H leads the field in Electric Shovel Developments.

It's the same pattern wherever these new P&H Electric Shovels go to work: The first machine sells the second — the third — and more.

The reasons are plain and simple — *better performance — bigger production — lower tonnage cost.*

Reasons behind the reasons are such advantages as P&H Magnetorque* which powers hoisting motions electro-magnetically — smoother, faster, more dependably . . . rugged all-welded construction with more strength to withstand shock loads . . . independent propel for quicker move-ups . . . stepless control which eliminates all contactor troubles . . . filtered air cab ventilation for less electrical down time.

The cold, hard facts that count are: *performance, production, low tonnage cost.* Figure your costs with P&H Electric Shovels and you'll find a convincing difference. It explains why every third P&H Electric Shovel sold is a repeat order.

*T. M. of Harnischfeger Corporation for electro-magnetic type clutch.

P&H ELECTRIC SHOVELS
4517 West National Avenue
Milwaukee 14, Wisconsin
HARNISCHFEGER CORPORATION

Every third P&H Electric Shovel sold is a repeat order

EXCAVATORS • OVERHEAD CRANES • HOISTS • ARC WELDERS AND ELECTRODES • SOIL STABILIZERS • CRAWLER AND TRUCK CRANES • DIESEL ENGINES • PRE-ASSEMBLED HOMES

Increase your production

Check this 50-ton rear-dump

BIG

50-ton, 41-yd. capacity . . .
Custom-built for your needs... capacity from 35 to 50 tons . . . bodies to fit your job.

Power to fit your job . . .
Engines from 275 h.p. Diesel to 450 h.p. Butane . . . will fit your grade haul conditions.

Choice of transmissions . . .
Conventional sliding-gear type . . . or constant-mesh type for instant speed changes.

***Torque converter available . . .**
Automatically selects proper gear ratio, maximum power at all times, removes shock loads in power train.

17'x13' top on 50-ton body
Speeds up shovel or dragline loading, cuts spill at loader, reduces delays for spotting.

30.00x33 low-pressure tires . . .
Give extra traction and flotation, longer tire life . . . absorb shock, help compact fills.

Power-proportioning differential . . .
Delivers 4 times more power to drive wheel on firmest footing, pulls through mud, snow.

Fast, over-the-bank dump
Far more brake per ton than any other hauler. Drive wheels stay on solid ground for safe, fast pull-out.

Positive power steer . . .
Push-button control of electric motor geared to king-pin gives safe control in any footing.

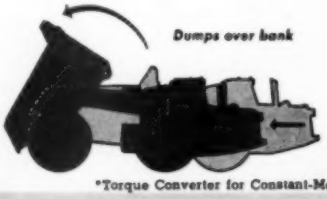
90° turns in 15' radius . . .
Big 36' rig turns in less than its own length . . . saves time spotting...saves time dumping.

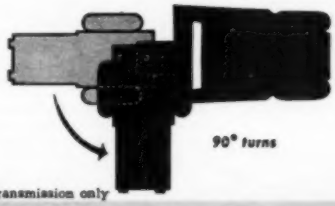
Reinforced steel grid bowl
Floored with ¾" tool steel over grid of 3" steel billets on 8" centers over ½" high carbon steel plate.

Complete self-cleaning . . .
Body dumps with floor at 58° angle...induction heating available for winter work.

Simplified, rugged construction . . .
No frames, sub-frames, springs, drive shafts, or hydraulic systems to maintain, repair, delay.

4-wheel air brakes . . .
Multiple-disc . . . 4792 sq. in. total braking surface, far more than other heavy haulers.





*Torque Converter for Constant-Mesh Transmission only

LETOURNEAU LET EQUIPMENT

Your LeTourneau Distributor will be glad to give you application facts and figures on this big "A" Tournarocker.

with model A Tournarocker

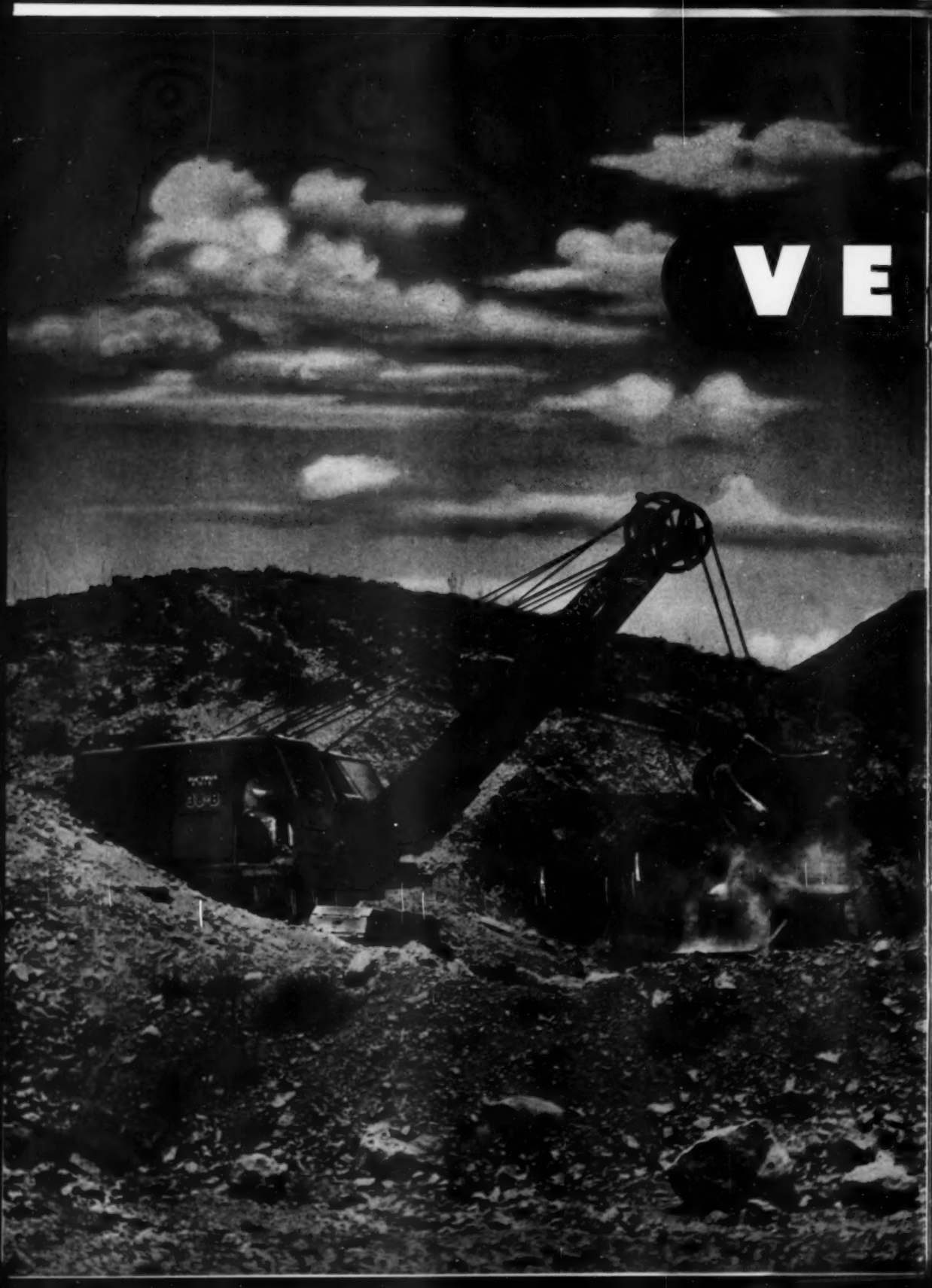
Here are a few of the leading concerns now using high-speed, rear-dump TOURNAROCKERS

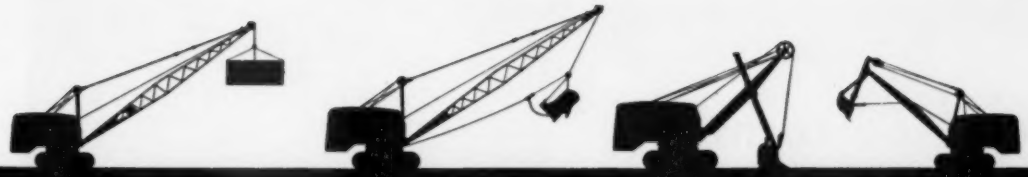
Babler & Rogers.....*Oregon*
Bagdad Copper Corporation.*Ariz.*
Roy L. Bair Co.....*Washington*
Barrage de l'Iril Emda....*Algeria*
Bates & Rogers.....*Illinois*
J. Robert Bazley, Inc.....*Penn.*
Billiton Mines.....*Surinam*
Adolph Bockus.....*Ohio*
Borderland Colleries.....*W. Va.*
Constructores Nacionales...*Mex.*
Dunn Limestone Co.....*Indiana*
Ft. Hartford Stone Quarry....*Ky.*
General Construction Co...*Wash.*
Grand Rapids Gravel Co....*Mich.*
Carl M. Halvorson.....*Oregon*
Horner & Switzer.....*Colorado*
Vernie Jarl.....*Oregon*
Leonard & Slate Ltd.
and E. C. Hall.....*Oregon*
Marsh Construction Co....*Illinois*
McGraw Construction Co....*Ohio*
Monolith Portland Cement Co....
.....*California*
Morrison-Knudsen Co., Inc.....
.....*British Columbia*
Muskoka Construction Co., Ltd...
.....*Ontario*
Nya Asfalt Aktiebolaget and
Svenska Vag Aktiebolaget.....
.....*Sweden*
Fred Onuparik Construction Co...
.....*Connecticut*
Orange Construction Co...*W. Va.*
Republic Steel Co.....*Alabama*
Skousen-Hise Contracting Co....
.....*New Mexico*
John Stark.....*Kansas*
Sydvaranger, A/S.....*Norway*
United Province Government.....
.....*India*
T. W. Ward Co., Ltd.....*England*
Frank W. Whitcomb Construc-
tion Corp.....*New Hampshire*
B. G. Young & Sons....*Tennessee*

Tournarocker—Trademark Reg. U. S. Pat. Off. C155

R. G. LeTourneau, Inc.

PEORIA, ILLINOIS


VE



RSATILITY

Mark of a Preferred Excavator

THE ability to handle dozens of jobs with peak efficiency on each . . . that's one of the marks of a preferred exacavator. And that's one reason why Bucyrus-Eries are favorites of owners and operators the country over.

Take the 1½-yard Bucyrus-Erie 38-B as an example. Its wide-spread mounting and ground gripping treads mean superior stability for fast crane, dragline, shovel or dragshovel service. Its compactly designed, easily accessible main machinery makes conversion simple, facilitates maintenance. Large, high-capacity clutches and brakes meet all demands of excavator and crane service, feature easy-to-make, long-lasting adjustments. "Full-feel" controls mean fast, accurate operation, the operator always in touch with the load.

These and many other features combine to provide the versatility of the 38-B and other machines in Bucyrus-Erie's outstanding ⅜- to 4-cubic yard line of gasoline, diesel and single-motor electric excavators. Top-notch performance with any front-end equipment is one more reason why Bucyrus-Eries are

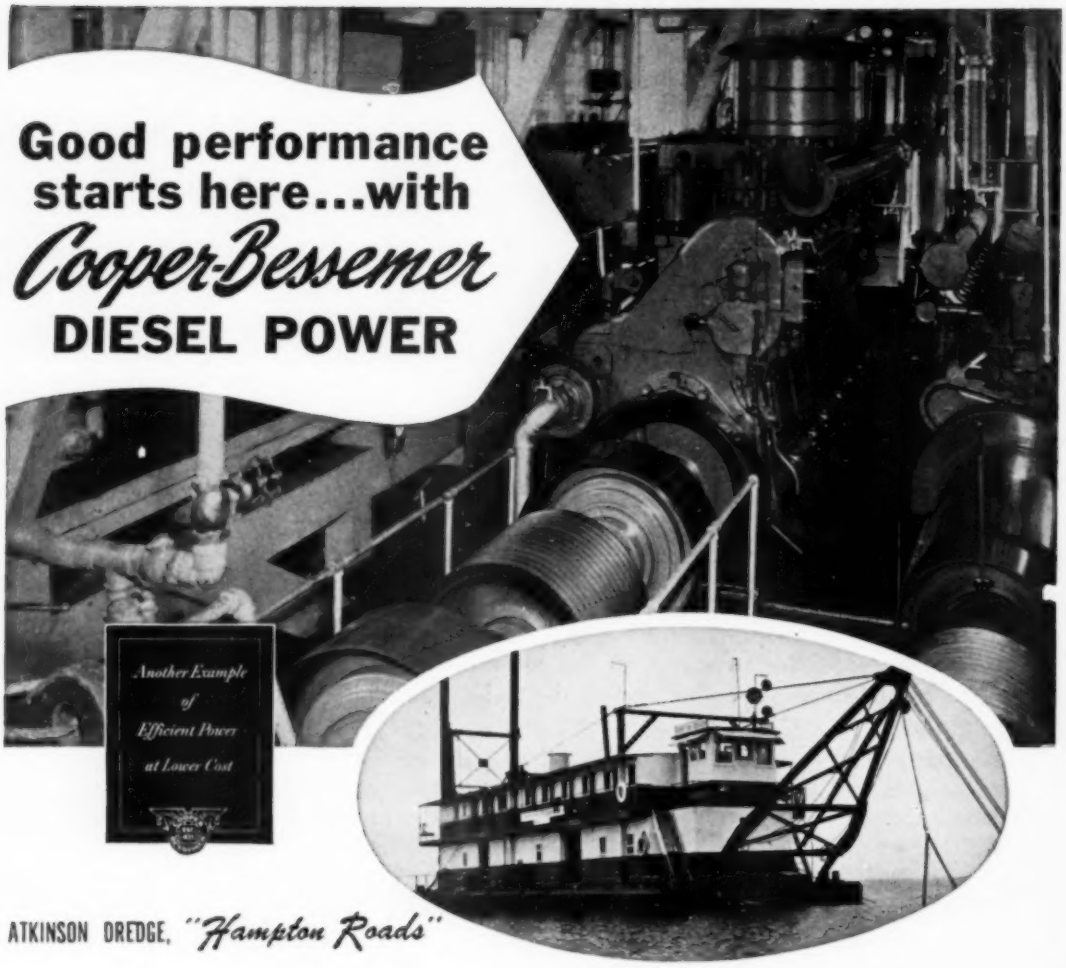
Most Compared

Most Preferred

BUCYRUS ERIE

SOUTH MILWAUKEE, WISCONSIN

Good performance starts here...with *Cooper-Bessemer* DIESEL POWER



ATKINSON DREDGE, *"Hampton Roads"*

Continuous output of full rated engine power is highly important in dredges, just as it is in many types of service. That . . . plus smooth-running, trouble-free operation . . . explains why D. D. Atkinson, president of Atkinson Dredging Company, is so pleased with the performance of the Cooper-Bessemer diesel now powering his reconditioned, repowered "Hampton Roads."

This 100-foot dredge now boasts an engine room layout rated one of the best for dredges of this size. The new Cooper-Bessemer diesel, a 760 hp Type JS-8, shown above, was installed in 1946 . . . has been in virtually continuous, full load operation ever since. Picked largely because of Cooper-Bessemer's reputation for fine-performing engines, the new diesel has proved a wise choice; will go on for years giving reliable, low-cost service.

Make the most of new advancements in diesel design . . . new stamina . . . new economy! Check with Cooper-Bessemer on your power needs.

The **Cooper-Bessemer** *Corporation*

MOUNT VERNON, OHIO — GROVE CITY, PENNA.

New York, N. Y. Washington, D. C. San Francisco, Calif. Seattle, Wash.
Houston, Texas St. Louis, Mo. Chicago, Ill. Los Angeles, Calif.
Gloucester, Mass. Calmes Engineering Co., New Orleans Caracas, Venezuela
Halifax, Nova Scotia Maxwell-Simpson & Associates, Vancouver, B.C.

A thousand and one wire ropes
PREformed and internally lubricated

The experience of hundreds of users—like yourself—goes into the making of Macwhyte Wire Rope. For more than half a century, their needs and yours have been studied by our engineers to produce the best wire rope for each job.

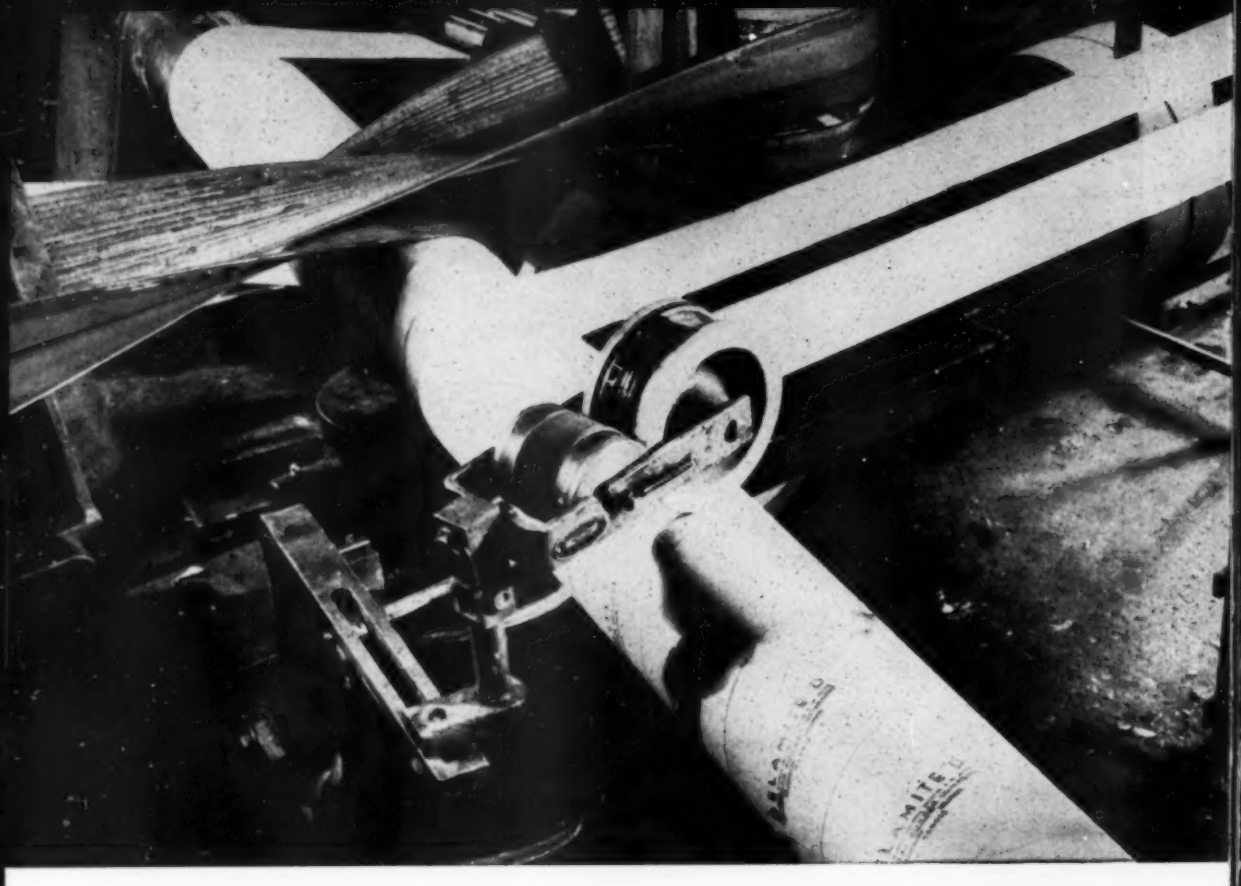
There are a thousand and one ropes to choose from. Recommendations are promptly available from Macwhyte distributors or Macwhyte Company.

Macwhyte Company, 2903 Fourteenth Avenue, Kenosha, Wis. Manufacturers of Internally Lubricated PREformed Wire Rope, Braided Wire Rope Slings, Aircraft Cables and Assemblies, Monel Metal, Stainless Steel Wire Rope and Wire Rope Assemblies. Mill depots: New York • Pittsburgh • Chicago • Minneapolis • Fort Worth • Portland • Seattle • San Francisco • Los Angeles • Distributors throughout U.S.A.

Catalogs are available on request

1017

PROGRESS IN EXPLOSIVES . . .



DYNAMITE, KING-SIZE

Did you know that dynamite comes in cartridges this big? Hercules pioneered in developing these larger cartridges which make for efficient blasting in large-scale coal stripping, open-pit mining, and quarrying operations.

These king-size cartridges range in diameter from 1¾ in. to 11 in. and weigh as much as 60 lbs. when filled. Spiral-wrapped in Hercules' own plants, they offer advantages in rigidity and smoothness. Other advantages: They are essentially their own shipping containers, are easier to handle and use, and can be stacked like cordwood.

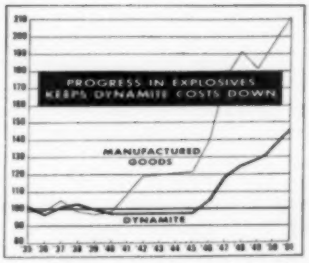


Chart shows relative stability of dynamite prices since 1935, as compared with prices of other manufactured goods. 1935-39 values=100.

HERCULES POWDER COMPANY

INCORPORATED

Explosives Department, 972 King St., Wilmington 99, Del.

XR52-3

IT STRIPS COSTS TOO
with help of TIMKEN® bearings

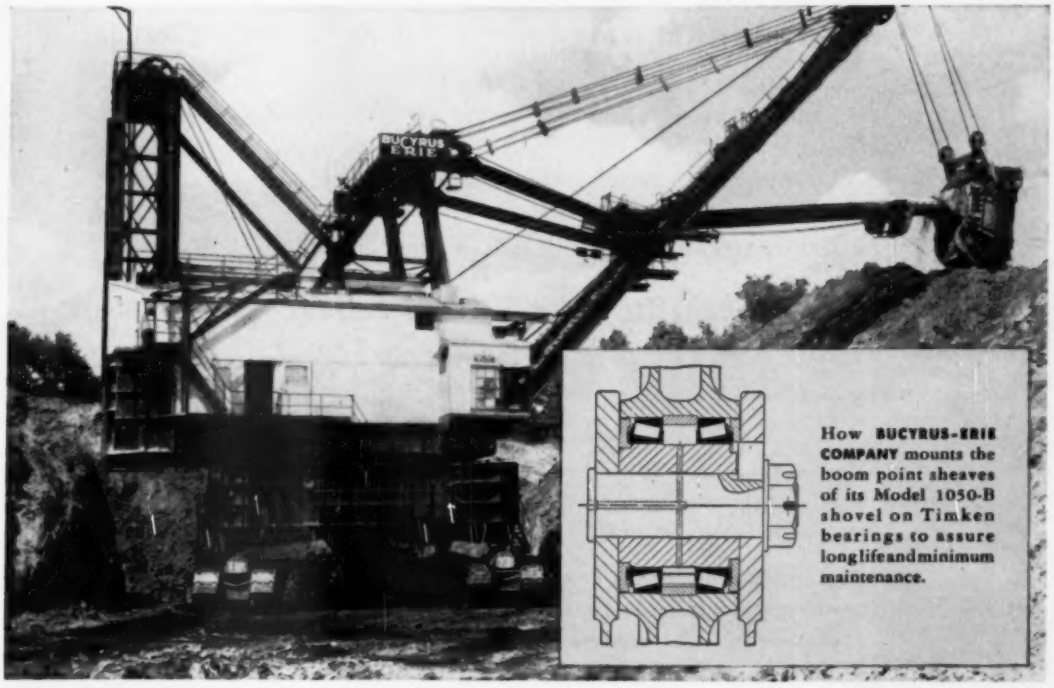
SHOWN here is a Bucyrus-Erie Model 1050-B shovel stripping overburden from a coal bed. It strips *costs* too—by staying on the job for long periods of time without requiring time-out for repairs or maintenance.

One of the ways Bucyrus-Erie Company builds this trouble-free performance into its shovels is by using a total of 30 Timken® bearings in the swing machinery, main machinery, crowd machinery, counter weight hoist and boom point sheaves.

Timken tapered roller bearings have exceptional load carrying capacity because of line contact between rollers and races. Since they take radial and thrust loads in any combination, Timken bearings hold shafts in rigid, positive alignment. Gears mesh properly, sheave alignment is assured.

Timken bearings give years and years of trouble-free life because they're engineered for the job, precision manufactured and made of Timken fine alloy steel. Be certain Timken bearings are in the equipment you build or buy. Look for the trade-mark "Timken" on every bearing. The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas, Ontario. Cable address: "TIMROSCO."

This symbol on a product means its bearings are the best.



How **BUCYRUS-ERIE COMPANY** mounts the boom point sheaves of its Model 1050-B shovel on Timken bearings to assure long life and minimum maintenance.

WE MAKE OUR OWN STEEL

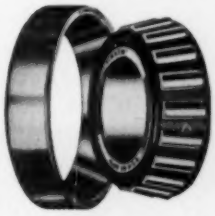
The special grade alloy steel which gives Timken bearings their strength and resistance to wear is made in our own steel mills.

The Timken Roller Bearing Company is the acknowledged leader in: 1. advanced design; 2. precision manufacturing; 3. rigid quality control; 4. special analysis steels.

TIMKEN

TRADE-MARK REG. U. S. PAT. OFF.

TAPERED ROLLER BEARINGS



NOT JUST A BALL ○ NOT JUST A ROLLER ⊂⊃ THE TIMKEN TAPERED ROLLER ⊂⊃ BEARING TAKES RADIAL AND THRUST → LOADS OR ANY COMBINATION

only Allis-Chalmers can offer you

1000 Hour

for truck wheels, idlers, support rollers

FULL PROTECTION — only One Greasing Every 1000 Hours — with Allis-Chalmers *Exclusive* Positive Seal, Roller Bearing Design!

Think of it! You can operate for 6 months on a 40-hour-week basis with just one lubrication of 14 to 20 of the most-abused, hardest-to-service points on a tractor. It's possible through an exclusive combination of glass-smooth Positive Seals and anti-friction bearings that help you do more work at lower cost even under toughest conditions! And it's another ahead-of-the-field design feature found only in the four new Allis-Chalmers tractors.

These Big Benefits Mean DOLLARS to you!

DAILY GREASING PERIODS ELIMINATED. You save at least 30 minutes every day . . . gain about one full month's production every year.

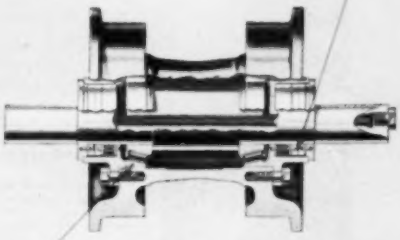
FULL PROTECTION ASSURED. Positive Seals keep grease in . . . dirt and moisture out. 1000-Hour Lubrication gives you protection unchallenged in the tractor field.

SAVES ON GREASE. Truck wheels, idlers and support rollers are grease-filled at the factory . . . need new grease only once every 1000 hours!

EASY TO SERVICE. No more cleaning of dirt, muck and grime from fittings every day. Operator can choose time and place to regrease when conditions are favorable.

Here's the secret:

Positive Seals each have two spring-loaded steel rings — one stationary, the other turning with the wheel. Ground smooth as glass, they seal the grease in . . . keep dirt, grit, dust, mud and water *out*.



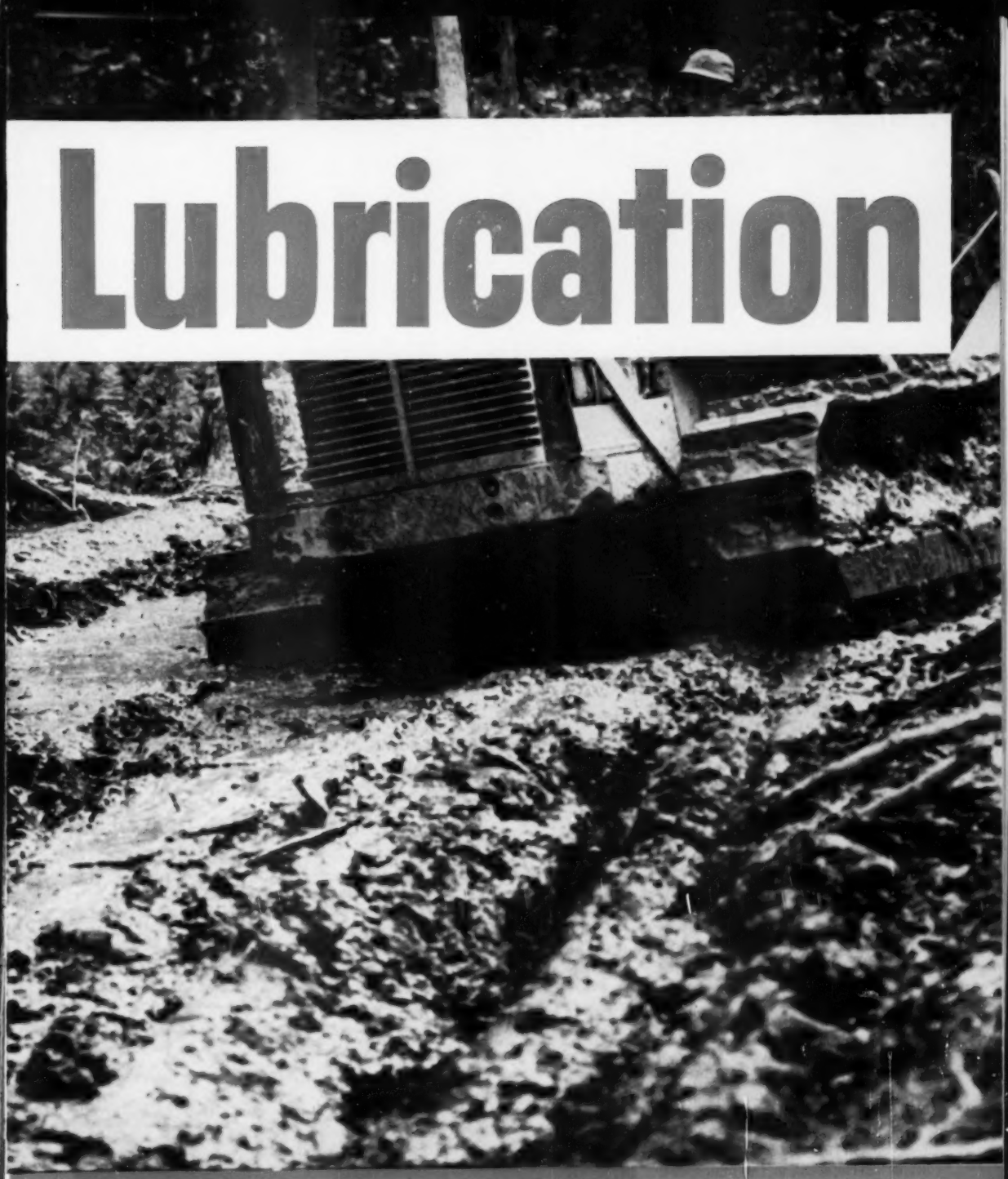
Tapered Roller Bearings protect the Positive Seals by letting truck wheels, idlers and support rollers rotate freely...without side thrust or wobble. Reduced friction lets the tractor move easier, produce more drawbar power.

the newest finest tractor line on Earth!

HD-20 HD-15 HD-9 HD-5

DESIGNED FOR YOUR JOBS • BUILT TO TAKE IT • EASY TO OPERATE • EASY TO SERVICE

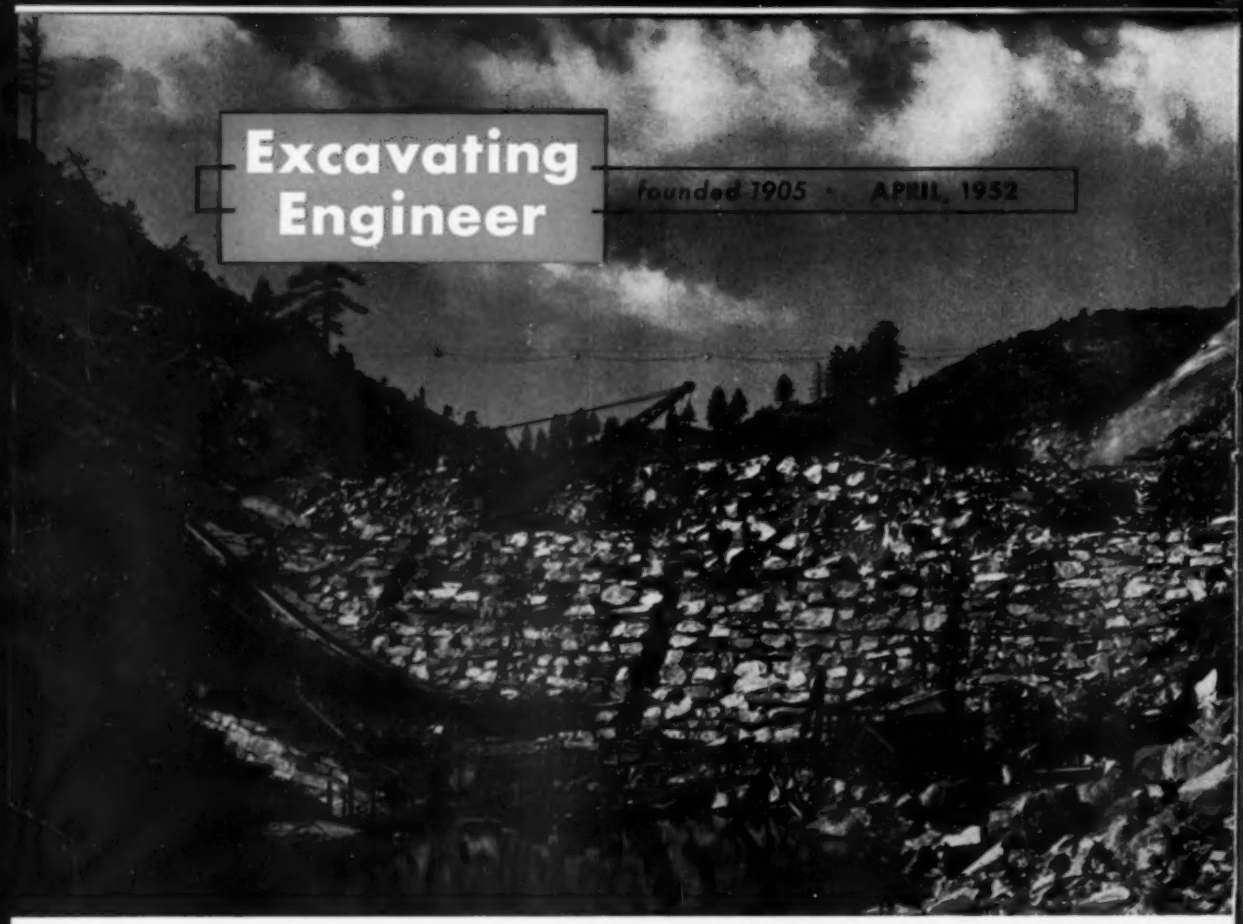
Lubrication



ALLIS-CHALMERS

TRACTOR DIVISION • MILWAUKEE 1, U. S. A.

Excavating Engineer
founded 1905 · APRIL, 1952



• In this upstream view of the main dam, core rock placing is seen at the upper right white face rock is set in the center. Flat face is necessary to help concrete slab resist stresses if dam settles. Maximum height of the dam will be 245 feet.

IT HAS been known for many years, of course, that rock fill dams were economically sound. They are indicated wherever good rock is found close by the damsite, especially if concrete aggregates are not readily available. Recent experiments by the University of California on scale models of various types of structures showed that rock fill dams stood up without a sign of failure under four times their designed maximum load.

One of the foremost exponents of the rock fill design is Pacific Gas and Electric Co. of San Francisco. It revived the type in 1931 when it built Salt Springs Dam, 328 feet high. When Salt Springs was built, it was the highest rock fill structure in the world.

P.G. and E. is continuing its use of rock fill, and finishing its Mokelumne River development in the high mountains 100 miles east of San Francisco headquarters with a new 39,000-hp unit on the Bear River, a tributary of the Mokelumne. The project is featured by a 230-ft. high rock fill dam, a combination surge tank and creek diversion, a 2,100-foot-head penstock, and a multiple jet, vertical shaft impulse wheel. The latter is the latest improvement in modern hydroelectric generating units.

P.G. and E. has let a $5 million contract to Utah Construction Co. of San Francisco for the work. It includes two rock fill dams, the concrete upstream facing, spillway overflow, outlet tunnel, and the control structure.

Purpose and Design

The purpose of the new development is hydroelectric power, kilowatts for an ever-growing population. When Bear River Dam is finished late in 1952, the water stored in its reservoir will pass through four major P.G. and

• At the quarry, A Marion 151 M shovel loads to a fleet of Euclids. Trucks haul to rock fill in background.

Revive Rock Fill at Bear River

by Robert J. Green

Rock fill, the natural engineering masonry of Julius Caesar's time, is being revived in the dam construction business. At Jackson, Calif., and several other places in the west, private power companies are bringing back the art of rock fill masonry designs to get the most out of their investment dollars.

E. power plants—Salt Springs, Tiger Creek, West Point and Electra before finding its way eventually to the East Bay Municipal District's Pardee Reservoir, one of the major sources of domestic water for the San Francisco bay area.

The Mokelumne is a good example of a highly developed stream. In its upper reaches are four reservoirs, which catch the snow runoff at an elevation of about 8,000 feet. Farther down the river, at an elevation of 4,000 feet, is Salt Springs Dam, with the others below that. The new Bear River Dam is at an elevation of about 5,800 feet, and there is an existing smaller rock fill dam slightly above the new structure to give added reservoir capacity. Altogether there are seven reservoirs which provide storage for the river power system, and farther down in the power plant area there are four forebay reservoirs to give complete water-saving flexibility to the power generating operation.

Bear River damsite is at a point where two massive granite domes oppose each other at the downstream end of a high mountain valley, and clean bedrock can be seen between them. This ideal site is somewhat spoiled by a low plateau beyond the right abutment which requires a wing dam. Stripping of 10 to 25 feet of overburden was required to bring the foundation in all places down to bedrock. Studies were made of concrete gravity, slab and buttress, and rock fill designs. The latter proved to be the most appropriate and economical structure.

Dam No. 1, the main structure, crosses the main Bear River and connects by 110 feet of roadway with Dam No. 2. The main dam is 1,050 feet long, has a crest width of 20 feet, and rises 245 feet high from the river bed at its highest point. The front slope facing the reservoir is 1.3 to 1, while the downstream slope is 1.4 to 1. These slopes make the dam about 665 feet wide at the base at the highest part.

The dam consists of dumped, washed rock fill, faced on the upstream side by a machine-placed blanket of large rock tapering in width from 10 feet at the dam crest to 20 feet at its base. A reinforced concrete facing, also varying from 12 to 33 inches in thickness, top to bottom, covers the upstream slope to achieve the desired watertightness. Copper water stops between construction joints are a feature of this impervious lining.

Altogether, Dam No. 1 contains approximately 990,000 yards of loose rock fill; 100,000 yards of placed rock; and 22,500 yards of concrete, including concrete in the valley-wide cutoff trench.

Dam No. 2 is a wing structure. Its base falls about 100 feet higher than the main dam, because it sets on the low plateau nearby, and runs at right angles to the main dam. Dam No. 2 is 1,120 feet long, 146 feet high at its maximum point, and has a crest width of 20 feet. Its front slope is 1:1, and in all other design respects it is similar to Dam No. 1.

The unit's function is shown by comparing several elevations. For example the dam crest is at elevation

● As Euclids dump core rock in Bear River Dam, high pressure water monitors keep a sluicing stream on the material. This washes out dirt and fines, helps to bed each large rock properly, and fills the voids with finer rock particles. All this makes for a piece of solid, strong masonry.

5,820, and the reservoir level is four feet lower. The Bear River tunnel inlet is at 5,690 about 95 feet above the low point of the dam. The outlet end of this tunnel is at 5,622.5. From that point the power penstock completes the 2,106-foot drop in 4,900 feet shooting the water into Salt Springs powerhouse at a nozzle elevation 3,712. The power drop is the third highest in the P.G. and E. system, exceeded only by those of the company's Bucks Creek powerhouse (2,562 feet) on the Feather River and Balch powerhouse (2,300 feet) on the King's River.

At a point 2,653 feet back from the main Bear River tunnel outlet portal, a low concrete, weir-type dam 225 feet long at the crest and 24 feet high will be built across Cold Creek. Like Bear River, Cold Creek is a tributary of the Mokelumne, which it enters three miles below Salt Springs Dam. The Cold Creek dam will divert the creek through a 438-ft. tributary tunnel and shaft into the main Bear River tunnel. The maximum diversion will be 800 cfs—600 going to Bear River reservoir, which is at a lower elevation than Cold Creek diversion, and 200 to the powerhouse. In a dry year about 35% of Bear River reservoir storage will be from the Cold Creek flow, and the diversion therefore is an essential feature of the project. It will have the additional purpose of acting as a surge chamber for the dual function of reducing water pressure on the penstock when valves are suddenly closed and providing water under proper pressure when the valves are opened.

Stripping and River Diversion

One of the first construction steps undertaken by the contractor was the construction of an outlet tunnel 10 x 12 feet in size for the diversion of Bear River during construction.

Stripping of the dam foundation and abutments was relatively easy, because little overburden lay on the massive granite formation. Since water under high pressure was contemplated for use in the rock fill later on, and because sluicing was unusually effective here, the foundation was prepared by sluicing the overburden away with high-pressure monitors. Two 350-hp General Electric motors driving 10-in. Cameron centrifugal pumps supplied the water from Bear River.

The area under Dam No. 2 gave the only preparation trouble, because it was a glacial deposit and contained some heavy gravel and rock which had to be hit full force to move. As a rule, however, the big monitors sluiced the area clean as they advanced. Sluicing started at the high points and gradually worked down in elevation, so the muddy water running away from the operation picked up other material on its way out of the lower parts of the area. The overburden washed on down Bear River, to be deposited in small islands. When the first heavy spring runoff of the river occurs, most of the visible signs of this operation will vanish as the material is carried on downstream.

The foundation was cleaned up especially well at the upper toe of the fill, where the concrete face lining keys down into solid rock in a monolithic cutoff key. Later on, this key was blasted out and cleaned to receive the first concrete.

Rock Quarry Opened

The whole area adjacent to Bear River Dam contains solid granite rock, so the main criterion in the selection of a quarry was hauling distance. A quarry was opened up to provide core and face rock from an operating area about 800 feet long by 210 feet high.

The rock formation has been scientifically classified by geologists as a grano-diorite, of extrusive igneous origin. It is hard, gray, and fine grained. It drills hard, and tends to break out in cubic chunks. After some experimenting with various types of drills, Utah decided to load the quarry from coyote holes or tunnels, drilled

• Project Manager R. K. Ames, studying daily cost sheets, was dressed in wool clothes for the rugged climate at the high altitude project.

into the formation by various methods.

Method No. 1 consists of a 3½ x 5-ft. coyote hole drilled vertically into the bank as far as 100 feet. Branching off from this main drift are side drifts on 50-ft. centers, with tees 35 feet long in each direction. Powder pockets are planned to fall on 20 x 40-ft. centers.

Method No. 2 consists of 3½ x 5-ft. coyote holes drilled parallel with the face of the bank for distances up to 200 feet, with drifts and powder pockets at right angles. Entry is made to the main drift in this case by a sharp-radius change of course which brings the coyote out of the bank at one end of the shot.

With either method, Atlas 40% Flo-Dyn powder is loaded into the pockets at a blasting ratio, so far, of .8 pound of powder per cubic yard of rock. Since some of the shots have brought down as high as 200,000 yards of stone, loading has been heavy in the coyote holes. Electric blasting caps and a 220-volt power line set the massive charges off, and the blasts are spectacular.

The blocky stone which tumbles down to the quarry floor from a typical shot is not wholly ready for dam fill, however. Specifications call for predominantly big rock, weighing several tons and over, and in no case can more than 5% be No. 4 and smaller. This makes for plenty of secondary drilling and breaking, as well as some wagon drill work to keep the quarry lined up and shaped.

Air equipment for this secondary work is powered from a feeder line leading from the air-supply house, where two 1350-cfm Sullivan compressors are located. Powered by 500-hp synchronous electric motors, these two compressors dump air at 140 pounds pressure into a receiver and send it to the quarry. Two Ingersoll-Rand and one Joy wagon drill use the air for drilling slope and lifter holes, and for lighter "high bottom" work on the quarry floor. There are approximately a dozen Ingersoll-Rand, Gardner-Denver, and Chicago Pneumatic jackhammers in the quarry for secondary work, ranging from 28-pound lightweights to the 55-pound rigs.

Excellent drilling results and drill bit life have been obtained by using Cormorant drill steel with tungsten carbide bit inserts, but drillers find it hard to say what the average bit life is in the granite formation. Despite its uniform appearance the rock varies as to hardness, and too, there may be a variance in bit hardness. The best drilling performance has been 1,600 linear feet on one bit, but in some cases only 250 feet wore the bits out. Ordinary rock bits need resharpening after they drill from 5 to 10 feet here.

Quarry loading facilities include a

• Three pictures below show explosion of nearly 50 tons of high explosives. Left: Contact is made and as the ground begins to lift we see smoke billowing along the quarry floor. Center: The quarry face is crumbling rapidly now. Right: Shot reaches final stage with heavy throw of rock off to right. Quarry face falls off in center. Many of the rock fragments will weigh several tons.

● Above: Workmen set steel for the reinforcement of a face slab pour while a Bucyrus-Erie 54-B crane places blanket stone. Below: Diamond drillers bore holes through concrete cutoff key down into solid granite. High pressure grout will be used to seal cracks.

Marion 151M shovel with a 6-yd. Esco dipper, and a Manitowoc 4500 shovel carrying a 5½-yd. Amsco dipper. Hauling equipment under these shovels is all Euclid: four 2FFD's of 22-yd. capacity, powered by V-12 engines which develop 400 hp; eleven TD3's, 8's, 13's, and 15's of 15-yd. capacity; and six smaller FD's, rated at 10 yards. There is also a D8 tractor and dozer for cleanup work around the quarry.

The 5½ and 6-yd. dippers on the quarry shovels will handle rock fragments up to 10 tons apiece. In fact, the larger size shovels were put on the job expressly for the purpose of handling the rock required to make a strong, solid fill.

Core Rock Placing: Exacting Work

The casual visitor seeing construction work at the dam for the first time might believe, at first glance, that the placement of core rock is considerably more haphazard than it really is. The big Euclids, loaded with stone, back up to the edge of a lift 95 feet high and end dump their loads. What rock doesn't roll down the slope is shoved over by a D8-mounted dozer, and that seems to be that.

But there is much more to the rock fill operation than this. In fact, this is perhaps the most important feature of the construction schedule, because experience gained at Salt Springs Dam during and since its construction has shown several things to be important.

For one thing, it is important to have the rock preferably in pieces from 1 to 10 tons. Rock should bear solidly on rock, and there must be no bridging and large voids. Long, rectangular blocks of rock should be laid at right angles to the slope face. At least three cubic yards of water should go into the dam for every yard of rock, in order to wash the dirt out and to bed finer pieces between the big stones. The use of water on a 3:1 ratio is good practical insurance in favor of a dense, strong fill.

These, then, are the general points of importance P.G. and E.'s men are thinking about when they direct rock fill operations, and to meet their wishes, Utah's crews have staffed the project with proper equipment and placing schedules. The two 10-in Cameron pumps, each driven by 350 hp electrical energy, dump into a 14-in. main line which carries the water to the top of the hill near the crest of the dam. Branch lines 6 inches in diameter then

carry the water to a pair of hydraulic monitors, whose nozzles discharge over the edge of the fill as the rock is dumped.

The first fill was started Apr. 23, 1951, when an initial lift 50 feet high was placed across the base of both dams. A 95-ft. lift was in progress on the main dam about the middle of November, when a bad snowstorm forced a winter halt to operations. There is no restriction on the height of lift of core rock; in fact, some of the P.G. and E. engineers believe the higher the lift the better the fill. When work was shut down the 15th of November, 1951, approximately 70% of the rock fill for both dams had been placed.

Bricklaying With 2½-Yd. Cranes

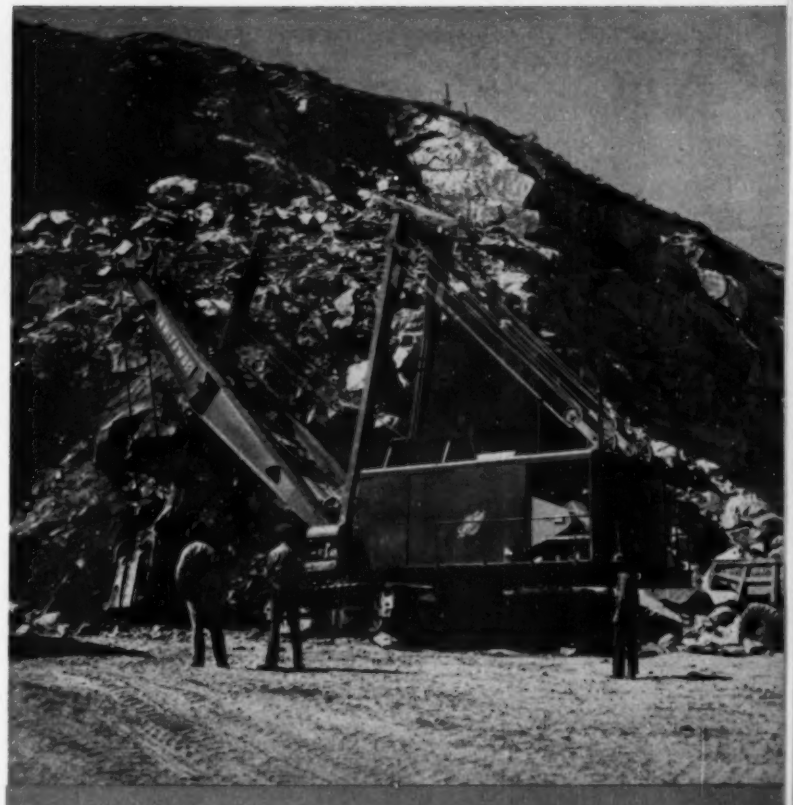
One of the most unusual and painstaking phases of the project is the placing of heavy selected masonry in stones weighing many tons apiece, with the aid of 2½-yd. draglines rigged as cranes. It is literally a bricklaying job with these big machines. To date it has been one of the toughest things of all to keep on schedule, because the careful placement of this rock has slowed machine production down to not over 30 yards per machine per 8-hour shift.

Placing cranes include a Bucyrus-Erie 54-B, three Northwest 80-D's, a Northwest Model 6, and a P&H 1055 machine. When work resumes in the spring, Utah officials plan to use as high as 9 rigs on this work. There will be another P&H 1055, an 80-D, and possibly another 54-B.

The machines work from timber pads, and place the facing stone in courses about 10 feet high per pass. Cable slings and orange-peel buckets are used to move the stone around, and the operation also calls for extensive use of labor gangs. Each stone is carefully placed to make a dense, compact face. But rock placing has become largely a lost art, and men are hard to find who can gauge the size of a rock, the way it should fit, and the best or strongest position for each piece. Crews had to be trained, and it was weeks before they became good enough to show very much speed.

The face of this placed rock has to be reasonably true, because precisely-placed concrete facing rests against the heavy rock, and it must be true to surveyor's templates.

Bad weather in the higher altitudes



● Above: A Manitowoc 4500 shovel loads 8H to Euclids. Machine also had crane front end for rock positioning. Below: Two P&H cranes handle clean-up pass on core rock in preparation for placement of rock blanket which covers core.

of the Sierra Nevada dropped over the job early in the fall, and nowhere did it hinder work more than on the slope paving. Men had to be especially careful not to slip and fall on the wet stone. It was hard to get fuel and supplies in to the machines. It was tough to walk the machines on anything but flat footing. Even the cable slings seemed to slip when rain and snow began to pelt the project. All construction work was recessed on Nov. 15, 1951, when the first heavy snowfall occurred. At the end of the year about 12 feet of snow lay over the entire area with drifts up to 25 feet.

As rapidly as the stone face is placed, concrete crews move in and begin placing the reinforced-concrete lining over the face of the dams. Operations are so scheduled that the concrete work never falls behind rock placing by more than one construction joint. This was especially important during the 1951 season, because the project officials wanted the concrete blanket up in the clear of a possible flood.

The concrete facing is being placed to form large blocks 60 feet long, and from 25 to 60 feet wide measured along the slope. Each joint has an accordion shaped copper water stop to make the facing perfectly watertight. The joints in the concrete facing rest on shallow concrete sills poured on the placed rock slope, and they are separated from the sills by asphaltic paint so if the dam settles the face can move without cracking. Actually, there is nothing problematical about the movement of the core. It is certain to settle, and the slab must be protected from destructive stresses.

In the lower 50 feet of lining at the dam toe, each slab has a double mat of 1-in. square steel reinforcing, placed on 12-in. centers. From the 50-ft. point on up to the crest, the mats have single reinforcement of the same size. The toe of the slab keys monolithically into a concrete cutoff key, blasted into solid rock, making the reservoir watertight across the valley. The contracting firm of W. C. Mitchell is core drilling and pressure grouting the granite seams below the bottom of the cutoff.

Concrete aggregates are manufactured by a Cedarapids crushing and screening plant about 2 miles upstream from the dam in the Bear River bottom. They are hauled to a Noble semi-automatic batching plant set up in the construction area at the damsite. They are then weighed in the right proportion with Permanente bulk cement, and dumped to a concrete mixer on a lower deck. The fresh concrete is transferred to the point of placement by Dumpcrete bodies on FD Euclids, which haul four yards at a trip to a wet batch collection hopper. A 2½-yd. laydown-type bucket, handled by a P&H 1055 crane with a 90-ft. boom, then places the material on the slopes.

Early lining work consisted of dumping the concrete in place at a stiff slump, and working it down to a finish with trowels. But when *Excavating Engineer's* representative was on the job, project manager R. K. Ames was busy designing a heavy steel form, with placing portholes, which would permit faster placing and better control over the finish of the lining.

● Northwest cranes work on pads to get the "bricklaying" job done on the dam face. This is one of the slowest and most painstaking parts of the Bear River project.

Equipment Upkeep

Equipment in use on the Bear River project gets a brutal beating in spite of the best kind of preventive maintenance. Operating conditions are rugged. Engines lose part of their horsepower at that altitude. Haul roads are rocky and hard on tires. And the constant dumping of 5-ton rocks into truck beds is not calculated to make them hold up well, either.

A 90-day program of major repair has been scheduled to last through the idle winter months to rebuild the damage to equipment. Extensive repair facilities have been installed, and except for short periods the job has not been entirely snowed in. California highway 88 passes within three miles of the dam, and it is customary for the division of highways to keep the snow plowed as far as a ski resort slightly beyond the dam, so trucks are able to

get in and out with parts and supplies most of the time.

As a routine measure when work is active, mobile service units visit each piece of equipment once a shift. Lubrication and other service follow the manufacturer's recommendations as closely as possible. A crew of trained heavy equipment mechanics under master mechanic M. M. Morehead makes necessary operating repairs to keep the equipment running with a minimum of down time.

According to project officials, the construction of rock fill dams opens up a new and promising vista for large equipment. There are 14 cranes and shovels at Bear River now, and by spring of 1952 there will be at least 20. This is an unusually large number of heavy pieces of equipment, and calls for a heavy repair program during the winter of 1951-52.

Personnel

The entire engineering conception of the Mokelumne River development dates back to 1930, when the late A. H. Markwart of P.G. and E. visualized the final result. Engineering plans for Bear River, Electra, and West Point plants were prepared by some of Markwart's proteges, including I. C. Steele, Walter Dreyer, T. J. Corwin and G. C. Green. Dreyer today is vice president and chief engineer.

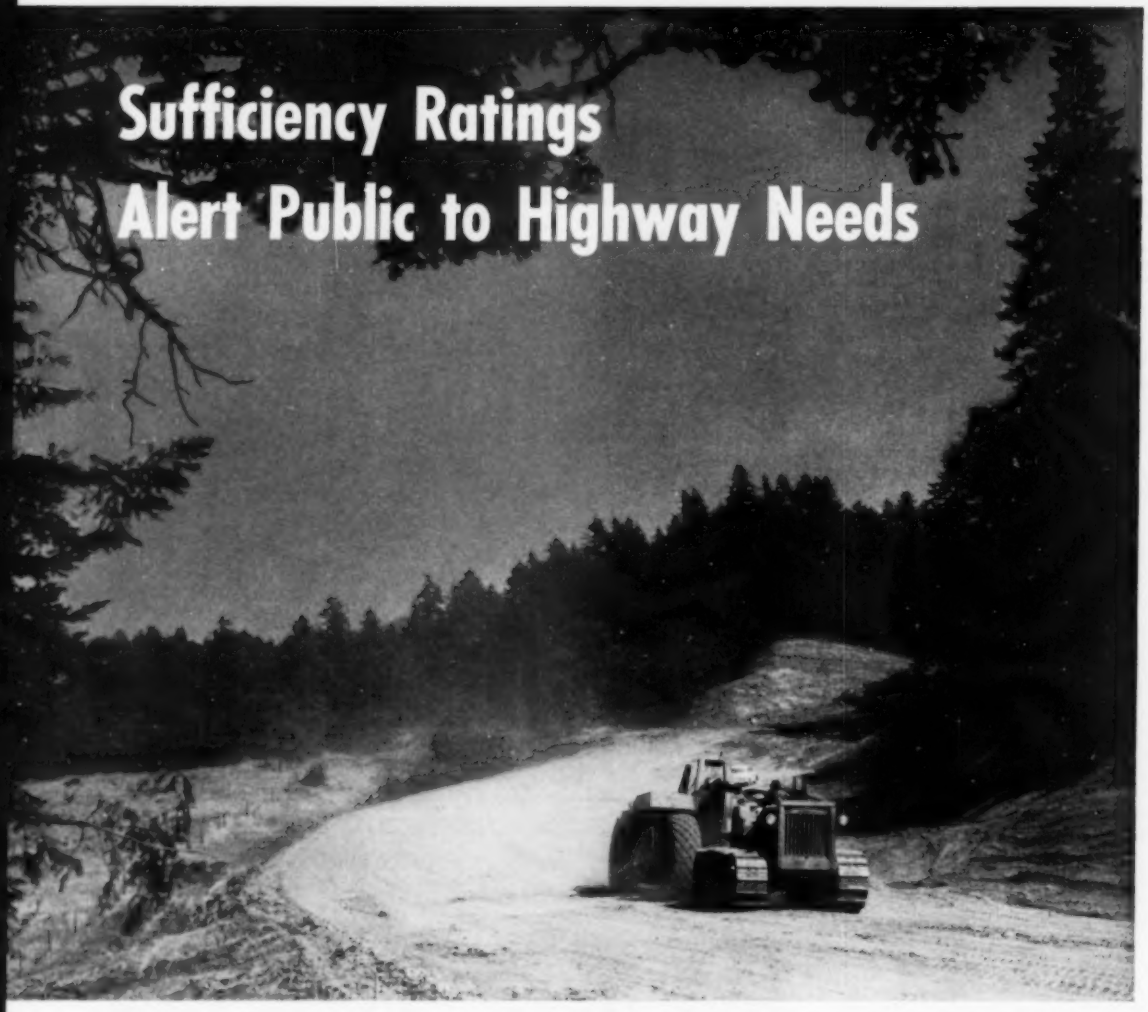
Field operations for P.G. and E. are under direction of H. W. Haberkorn, engineer of hydroelectric construction, with J. E. Cooney as general superintendent of hydro construction. G. B. Thatcher is project engineer.

For Utah Construction Co., R. K. Ames is project manager, Ben Arp is general superintendent, J. A. Thoroughman is office manager, B. O. Sandberg is project engineer, William Ketron is steward, and master mechanic M. M. Morehead is assisted by Herb Alexander. J. F. Wise and E. R. Steeples are construction superintendents in the field.

The use of rock fill dams started almost by accident following the gold rush of 1849, when miners built rock fill structures to impound placer water. When the reservoirs outlived their usefulness, the power companies became the logical inheritors. Not only have these private power companies proved the soundness of the old structures, but they are pointing the way toward great engineering feats with rock fill in the future.

• Above: Hard rock tunnel men drive 8 ft. 6 in. by 11 ft. tunnel through granite. Tunnel will connect Bear River Reservoir to the 2,106-ft. power drop into Salt Springs powerhouse. The 13,600-ft. passage will not have to be concrete lined. Below: Typical high-drop powerhouse installation — P. G. and E.'s Power House No. 5.

Sufficiency Ratings Alert Public to Highway Needs



BEFORE World War II, a Pittsburgh motorist could move from fashionable South Hills to the downtown district in 10 minutes. Today, he needs five times as long to make the trip. Boston police estimate they spend 30% of their time on traffic problems. In St. Louis, about 350,000 autos and trucks pour through the downtown section of the peak travel times. This adds up to one vehicle for each family in the city and adjoining suburbs.

Americans now own more than 52 million autos, trucks, and busses. In seven years since the end of the war, registration has gone up 68% over 1945's 31 million vehicles.

Other figures point up the swarm of automobiles crowding our highways. For instance, gasoline consumption has risen nearly 50% since 1946, the first full year after rationing. Death and accident tolls have mounted to the extent that many insurance companies increased their rates—some as much as 30% during 1951.

Contrasting with this flood of highway users are the highways themselves. Figures of the U. S. Bureau of Roads show that total U. S. highway mileage has actually decreased since 1945 from 3,316,000 to 3,313,000. However, the bureau reports the drop was mostly in unsurfaced highways. Paved roads made an insignificant gain from 1,718,000 to 1,905,000 miles.

These facts lead to one conclusion: The public has been buying cars but is not interested in buying better roads. A simple tool is needed to express road deficiencies in graphic terms. The Sufficiency Rating System for highways is rapidly being recognized as just what the doctor ordered. It shows the condition of the state's highway plant in non-technical language for all to understand.

Broadly defined, sufficiency ratings are values assigned to every section of a highway system to summarize its adequacy as an arterial for the traffic it carries. A completely adequate highway will be given a rating of 100. Below par ratings in structure, service and safety will cut down the total rating of a given section.

The end product is a rating for each road section showing its adequacy alongside all other road sections as

well as the perfect score of 100. The lower the rating, the poorer the highway—the greater the need for improvement.

The cars and trucks that created the road problem have an easily measured value. A prospective purchaser can buy on the installment plan because he can determine a future liquidation date based on price. With the sufficiency rating system, a price for keeping the road in adequate condition can be determined as well as a future liquidation date for a 100-rated road. It may thus be easier to muster the public and official backing necessary to "buy" roads.

How do you rate a highway on the basis of 100 points? In the Highway Research Board Bulletin No. 17 of December, 1948, a detailed account of the development and application of the ratings is given by the man who originated them, Karl Moskowitz.

In brief, this is the method: Par ratings are given a number of elements. such as estimated life, stop sight distance, surface width. These elements go to make up three main groupings—*condition, safety* and *service*. If the groupings are given values of 35, 30, and 35, the total is 100, or a completely adequate highway. The reproduction of the field form used by the State of Arizona on which ratings for a specific road section are shown for the years 1947-52 will help to clarify the rating mechanics.

With the U. S. road program falling behind traffic loads, a highway-condition "scoreboard" is needed to show at a glance where we stand. Sufficiency ratings, a recent development, can make highway needs easily seen by both officialdom and the driving public.

Under each year, one can see how the rating for the particular section is worked out. In 1947, the structural adequacy was "poor" so the road got only 7 out of a possible 17 points. The estimated life was about spent so it got only 2 out of a possible 13. And for maintenance economy, the road was rated 3 out of a possible 5. The total *condition* rating in 1947 was 12 out of a possible 35. The grand total rating was 48 out of the possible 100.

It will be seen that the road received a 100 rating in 1949. This resulted from reconstruction of the project. The roadway width was extended to 40 feet. It had previously been 22. Surface width was built to 24 feet. It was previously 18, and so forth.

Adjust Ratings

In the lower left hand corner of the field form are shown the basic and adjusted sufficiency ratings for each year. Adjustments are made to reflect the traffic importance of the road. A road carrying more than average volumes of traffic has its sufficiency rating lowered. A lightly traveled road has the sufficiency rating adjusted upward.

Next, a cut-off point must be established. This is the rating below which road sections are inadequate for proper service to motor transportation. If for a particular road system it is determined that ratings of 65, on the suffi-

● This field form was used by the State of Arizona. Ratings for this road section are shown for years 1947-52.

ARIZONA HIGHWAY DEPARTMENT • DIVISION OF ECONOMICS AND STATISTICS • HIGHWAY SUFFICIENCY RATING SYSTEM

ROUTE	LOCATION	MP	TO MP	COUNTY	FAP	YR. BUILT	ROUTE MILE		LENGTH	DIST	SERIAL
66	BETWEEN PADRE AND DIABLO			CNO	81 P 6	49	238.10	TO 248.89	10.79	1	163

CONDITION

	PAR	1947 REMARKS	1947 RATE	1948 REMARKS	1948 RATE	1949 REMARKS	1949 RATE	1950 REMARKS	1950 RATE	1951 REMARKS	1951 RATE	1952 REMARKS	1952 RATE	1953 REMARKS	1953 RATE
Structural Adequacy	17	POOR	7		6	EXC.	17		17		17		17		
Estimated Life	13	MIX 30	2		1	MIX 49	13		13		13	SEAL 51	13		
Maintenance Economy	5		3		2		5		5	BOXES	4		4		
CONDITION	35		12		9		35		35		34		34		

SAFETY

	PAR	1947 STD	1947 ACT	1947 RATE	1948 STD	1948 ACT	1948 RATE	1949 STD	1949 ACT	1949 RATE	1950 STD	1950 ACT	1950 RATE	1951 STD	1951 ACT	1951 RATE	1952 STD	1952 ACT	1952 RATE	1953 STD	1953 ACT	1953 RATE
Roadway width (marginal friction)	8	38	22	0	40	22	0	40	40	8			8			8			8			
Surface width (medial friction)	7	22	18	3	24	18	1	24	40	7			7			7			7			
Stop Sight Dist (intersectional fr.)	10			5			8			10			10			10			10			
Consistency	5			5			4			5			5			5			5			
SAFETY	30			13			13			30			30			30			30			

SERVICE

	PAR	1947 STD	1947 ACT	1947 RATE	1948 STD	1948 ACT	1948 RATE	1949 STD	1949 ACT	1949 RATE	1950 STD	1950 ACT	1950 RATE	1951 STD	1951 ACT	1951 RATE	1952 STD	1952 ACT	1952 RATE	1953 STD	1953 ACT	1953 RATE
Alignment (safe speed)	12			11			11			12			12			12			12			
Passing Opportunity	8			7			7			8			8			8			8			
Surface Width	5			1			0			5			5			5			5			
Sway	5			2			3			5			5			5			5			
Roughness	5			2			2			5			5			5			5			
SERVICE	35			23			23			35			35			35			35			

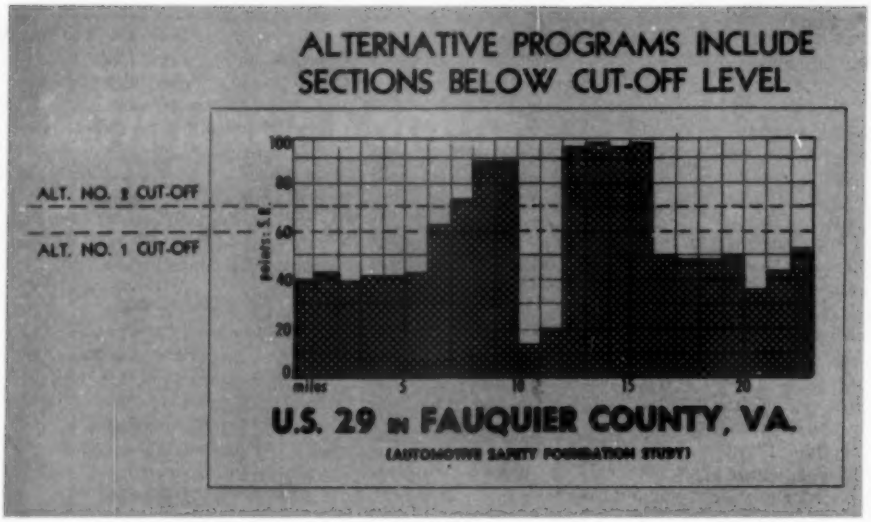
Year	1947	1948	1949	1950	1951	1952	1953
Basic Sufficiency	48	45	100	100	99	99	
Avg. Daily Traffic	2074	2055	2267	1867	2374	2812	
Traffic Adjusted	43	41	100	100	99	99	

Shoulder Type
Shoulder Width
Topography
Class

Odometer

From	40.8	40.9	31.3	END 81 REO
To	50.5	50.7	21.5	
Dist.	9.7	9.8	9.8	

Bridge Width
Bridge Length
Bridge Type
Posted Load Limit
Vertical Clearance



• Mile by mile ratings are given for this 23-mile section of highway in Virginia. Two cut-off points were made to indicate results of alternate levels of tolerability.

ciency rating scale, represent the dividing point between satisfactory and unsatisfactory road sections, this is the cut-off point—65. It shows the minimum acceptable level for any part of the road system. On completion of the program, the entire road system will have ratings higher than the cut-off point. Establishing the cut-off point is similar in the sufficiency rating approach to the establishment of tolerable standards that has been done in a good many states.

With the cut-off point set, all road sections having sufficiency ratings below it are placed in the category of urgent needs. Estimates of cost for projects to provide the necessary improvements are accumulated and represent the total urgent needs.

If the deficiencies were to be remedied at once, the "urgent needs" total would represent all the program. However, in setting up the program over a period of ten years, as is generally recommended, it is understandable that additional deficiencies will develop.

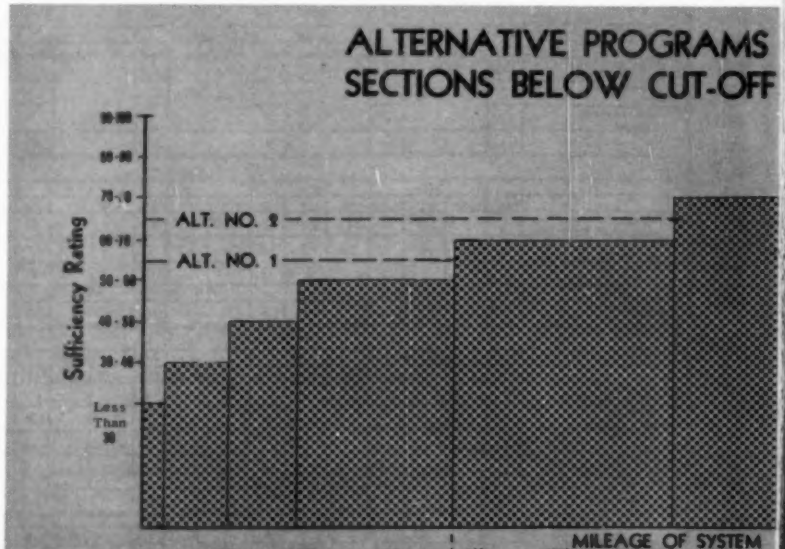
There will be structural deteriorations, for example, which cannot be foreseen at the present. Based on past experience and estimated additional traffic, it is possible to set allowances for these items. This is then added to the present urgent needs.

So far the construction part of the program has been set up. To it must be added requirements for maintenance and administration to get the total cost of developing and preserving the highway system.

With the sufficiency rating procedure it is possible to set up alternate programs based on more than one level of tolerability. The accompanying chart shows the ratings mile by mile along a 23-mile section of U. S. 29 in Virginia. Two cut-off points have been superimposed on this chart to indicate the results of alternative levels of tolerability.

In this case, alternate 2 would place the section beginning at mile 6 in the category of urgent needs whereas alternate 1 would not.

The other chart shows an entire road system arrayed according to sufficiency rating of individual road sections. The result of applying two cut-off points to obtain alternative programs is indicated, using the same two levels applied to the section of Virginia highway. Here, under alternate 1, 749 miles of the system, or 33%, are classified as



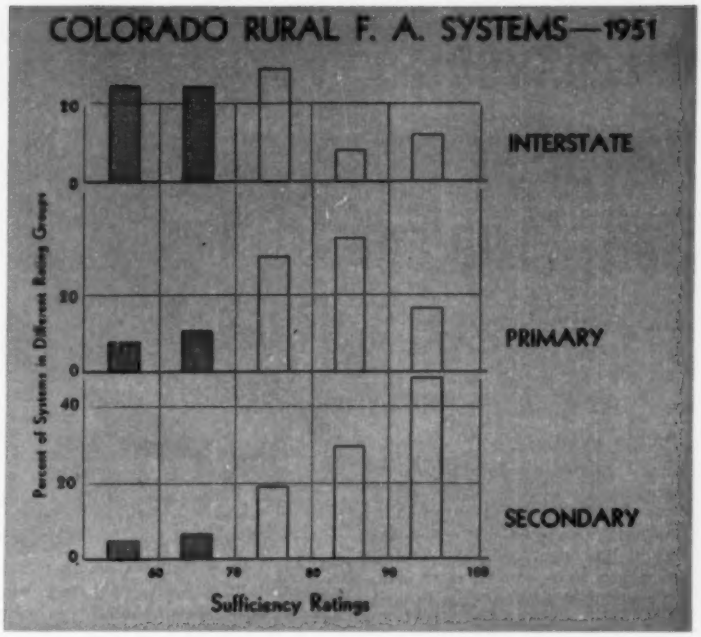
urgent needs. Under alternate 2, there are 1,283 miles or 56%.

The magnitude of the urgent needs mileage and the cost to meet these needs are not directly proportional to the magnitude of the alternative long range programs because other elements affect the program. They do provide alternative levels of deficiency from which alternate programs can be developed.

State highway engineers using the sufficiency ratings should bear in mind that it is important to keep them current. The mileage of the system each year below critical rating will serve to check the effectiveness of the long range program. Here again is data presented in the annual reports of the Arizona Highway Department. It shows the constant improvement as reflected in the decreasing mileage in the federal-aid primary system falling below two alternate cut-off ratings.

	Mileage at or below	
	50 points	60 points
1947	282	650
1948	264	564
1949	195	601
1950	161	538
1951	211	479

Let's illustrate the use that can be made of this type of survey. Assume that on Jan. 1, 1947, a ten-year program was established based on a cut-off point of 60. In ten years the present deficiencies must be eliminated along with the additional mileage falling below 60. The mileage below 60 as of the 1st of January each year should be reduced at a fairly regular rate until it becomes zero on Jan. 1, 1957.



• In this Colorado report, sufficiency ratings show greater needs of interstate system compared with primary and secondary routes. Shaded bars on chart represent road sections below 70 cut-off point which are programmed as immediate needs.

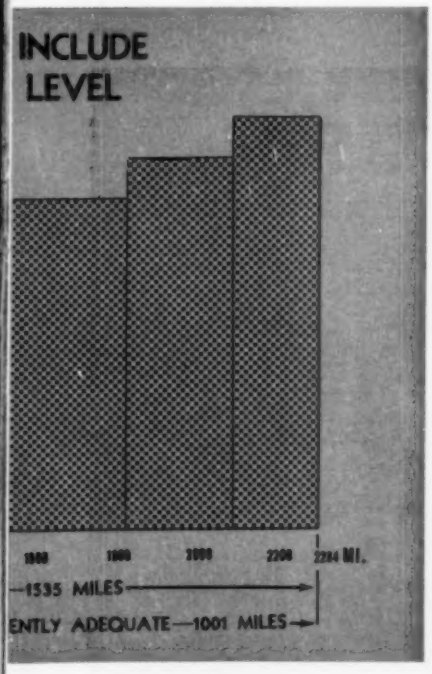
All too frequently, legislative provisions for highway finance do not give sufficient emphasis to main highways. There is need for a programming process which will throw light on the needs of a state's entire road system.

The final chart illustrates the way in which sufficiency ratings point up the much greater urgency of needs on the interstate system in Colorado, taken as an example, as compared with other federal-aid primary routes and secondary routes. In this report, 70 is the cut-off point at which road sections should be programmed as immediate needs. The shaded bars on the chart represent such sections. About 50% of the interstate system falls in this class. This compares with 18% for other federal-aid primary routes and 12% for secondary routes.

Most traffic engineers and the U. S. Bureau of Public Roads agree that miles of road aren't the big thing. It's quality that counts: Things like four and six-lane superhighways, cloverleaf intersections, elimination of bottlenecks such as old bridges. It is certainly true that highway design has not kept pace with the design of the streamlined automobiles that use them. A survey in Dallas brought out the fact that 65% of the traffic pouring through the downtown section was headed somewhere else. Drivers had to go through the center of town to get from one side to the other. Here, as in most large cities, is a big job in planning.

A motorist stopping in an isolated Ohio hamlet found the 400 townspeople so incensed over the traffic problem that they thought they would shortly have to install a traffic light. But stop lights will never take the place of a continuing highway modernization program.

Sufficiency ratings provide a sound, yet flexible, basis for this long-range plan. They have the important quality of being readily understandable to the not-technical-minded public and official whose support is necessary to put and keep the program in motion.



• Here entire road system is charted according to sufficiency rating of individual road sections. Using same two levels applied to section of Virginia highway, result of applying two cut-off points to obtain alternate programs is indicated.

Caissons Solve Soil Problem

• Whirleys working atop the Veteran's Administration Research Hospital stand out above Chicago's skyline. Upon completion structure will stand 20 floors above street level.

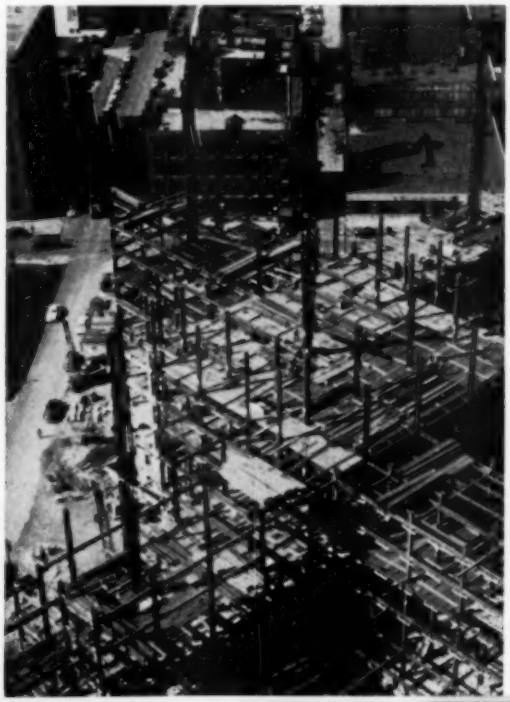
REMOVING 155,000 yards of fill, sand and clay to a depth of 56 feet in 48 days meant a good start on the $13 million in contracts that W. E. O'Neil and Kenny construction companies have for the Veteran's Administration Research Hospital near Chicago's loop. As reported in the August, 1950 issue of *Excavating Engineer*, excavation for "Chicago's Biggest Basement," was completed the 3rd of July that year. However, as the job proceeded, inherent characteristics of the plastic clay which underlies the site made it more and more apparent that there would be considerable difficulty in keeping the foundation piles in position. As a result, pile driving was halted in mid-December, 1950 with about 1,800 piles in.

The contractors obtained authorization from the architects and owners to supplement the remaining 1,000 piles with 70 hardpan caissons, which varied in size from 4 feet to 6 feet 6 inches in diameter, with extremely large bells at hardpan elevations. They were sunk to approximately minus 80 feet elevation, 94 feet below street level. The caisson operation was completed the 4th of April.

Nearing Completion

Despite the delay incurred by this extra operation, W. E. O'Neil, president of O'Neil Construction Co. and A. J. Carlson, general superintendent for the joint venture contractors, say that they expect to complete the contract about Jan. 1, 1953. At the time of *Excavating Engineer's* last visit to the job, approximately 14,000 cubic yards of concrete had been poured below grade on substructure slabs and walls.

• Below left: This picture showing excavation in full swing appeared on cover of August, 1950, *Excavating Engineer*. Below: Compare this with recent shot which looks down on elongated X shaped structure.



• Above left: W. E. O'Neill, president of the O'Neill Construction Co., checks progress with master mechanic Ed Donovan. Above: A. J. Carlson (left), general superintendent for both O'Neill and Kenny, pauses in midst of late afternoon work conference with Dave Olson, field superintendent, and (right) Col. T. F. Montgomery, Veterans Administration construction engineer.

Over 9,000 cubic yards had been poured above grade, leaving some 10,000 cubic yards of slab, columns and beam concrete yet to pour.

When the sub-grade concrete was being poured, O'Neil Construction

O'Neil and Kenny, joint venture contractors, supplement piles with caissons to solve soil problems and push completion of Veteran's Administration Research Hospital over "Chicago's Biggest Basement."

utilized two Foote Model 34-E 1¼ yard mixers to supply ready-mixed concrete to master mechanic Ed Donovan's Bucyrus-Erie 38-B. Shuttling between the two mixers with the concrete bucket, the crane handled as much as 735 yards of concrete in a regular 9½-hour working day.

On superstructure work only one of the mixers was being used. Pouring to the fifth floor level, Donovan's machines were supplying an average of about 400 cubic yards of concrete every 9-hour working period.

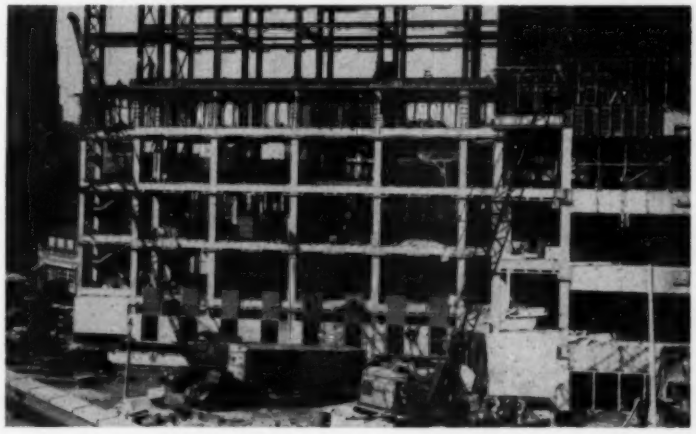
Steel Erection

Steel erection started the 22nd of February, with the sub-contract being handled by Bethlehem Steel Co. Approximately 70% of the erection has been completed to date. In these days of short steel supplies it is significant that all the steel required to complete the structure is available at fabricating plants. A total of some 5,800 tons of structural and 2,200 tons of reinforcing steel will be used.

Cranes Work Hard

The contractor had three Bucyrus-Erie 38-B cranes working on the job until all the foundation work was completed. Supplying concrete to the upper levels is the job of the one remaining, but it is also used for moving other supplies. O'Neil has two Bucyrus-Erie 22-B Transit Cranes handling a variety of jobs around the site, from hoisting brick and mortar to setting the limestone blocks with which the completed hospital will be faced. And for the hundred-and-one odd jobs that every construction project has, the contractors can call on any of three handy rigs—a Bucyrus-Erie H-3 Hydrocrane, a Hough Model HS Payloader, and an Allis-Chalmers HD-5G Tracto-shovel. A Worthington Model 210 compressor

• One of O'Neill's two Bucyrus-Erie 22-B Transit Cranes on job handles steel for structural sub-contractor Bethlehem Steel Co. as Bucyrus-Erie 38-B in foreground supplies concrete to fifth floor crew.



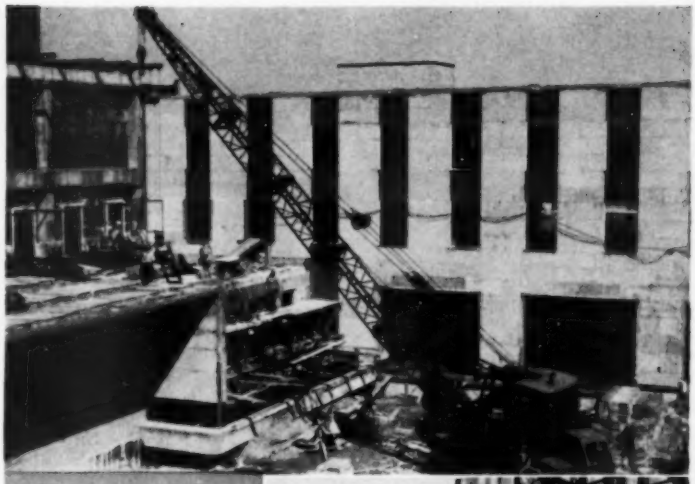
supplies air to the riveting crews, and there are four American Hoists available at the top levels, two automatics and two manuals.

As construction proceeds, the shape of the new hospital becomes increasingly clear. Viewed from the upper floors of the famous Furniture Mart across the street to the east, it takes the form of an elongated X with a main structure at the center rising to 240 feet above the street at the 20th floor level, and wings at various lower levels. At the east end of the block, a separate three-story V-shaped nurses' quarters is being built, connected to the hospital by a flexible joint to retain architectural unity.

Special Design

The hospital is designed exclusively for research, with special equipment being supplied partly by the contractors and partly by the veteran's administration. One of the reasons why the substructure required so much concrete was the specification of 2 feet 10 inch thick walls for the basement room housing a 50-million-electron-volt Betatron. The hospital will also have lead-lined walls wherever radio-therapy equipment requires such protection for personnel.

Mr. Carlson, general superintendent for both contractors, has as his assistants John Een for O'Neil Construction and George Kephert for Kenny. Dave Olson is field superintendent, and Col. T. F. Montgomery is construction engineer on the job for the Veteran's Administration. Schmidt, Garden and Erickson of Chicago are the architects.



• Above: 22-B Transit Crane swings facing stone, brick, and concrete to masons working on nurses' quarters at corner of main building. Right: Hero Bucyrus-Erie H-3 Hydrocrane performs one of its many duties as it swings concrete buggy to masons at work on northwest wing walls. Below: One of the fleet of Ford and Chevrolet trucks supplies concrete mix to Foote Model 34-E, 1¼-yd. paver.

an ACCO product

The BRAND is mighty important

● This HAZARD brand on wire rope got started in 1846. It's a top brand today not because it goes back 106 years but because Hazard wire rope has kept on improving.

Hazard research and engineering has built more hours of useful work into ropes that carry this brand name. It has experimented with metals and alloys and every known lay. It is working harder than ever today improving the ropes that bear its name.

Hazard's especially proud of its LAY-SET Preformed WIRE ROPE. You can tell it by the green strand. It lasts longer and costs less to use.

makers of ACCO Registered WIRE ROPE SLINGS

ACCO

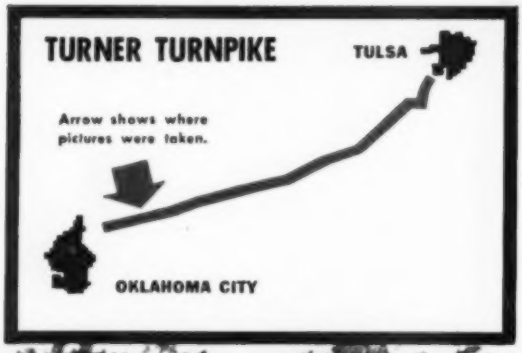
HAZARD WIRE ROPE DIVISION
AMERICAN CHAIN & CABLE

TRADE MARK

Wilkes-Barre, Pa., Chicago, Denver, Houston, Los Angeles, New York, Odessa, Tex., Philadelphia, Pittsburgh, San Francisco, Bridgeport, Conn.

Turning on the Power on the

Turner Turnpike



"Big Red"—the International TD-24 —carries the load for contractors on Oklahoma's new superhighway

12,500,000 cubic yards of earth are being moved to build the great new Turner Turnpike—a four-lane, limited access superhighway between Oklahoma City and Tulsa, 88 miles away.

Contractors on the job report that their International TD-24s are moving more dirt per day, because they have more power, more speed and more steer-ability than any other crawler on the market.

As Vernon Pool of Pool Construction Co. says, *"Nothing can beat these TD-24s. We have ten of them on our section of the Turner Turnpike. They out perform any other tractor I've ever seen. Our operators love them.*

"We've had all kinds of tractors, but the next ones I buy will be Internationals, too. One big reason besides their performance is that we always get prompt service from our International Distributor."

Get the low-down on TD-24 superiority from your International Industrial Distributor. Then consider the service he offers you—and you'll be a TD-24 man yourself from then on in!

INTERNATIONAL HARVESTER COMPANY, CHICAGO 1, ILL.

HAPPY CONTRACTOR is Vernon Pool (right) as he tells International Distributor D. V. MacDonald how good his TD-24s are. "One of them has 6,655 hours on the meter in three years," says Pool, "and it's working right along with the others."

INTERNATIONAL HARVESTER

INTERNATIONAL

POWER THAT PAYS

TEN TD-24s GIVE PLENTY OF POWER FOR POOL. Pool Construction Co. is one of seven contractors with fleets of International crawlers on the Turner Turnpike. Pool has 14 Internationals on its section of the job, and 10 of them are TD-24s. Here you see three of these "Big Red Champs" push-loading self-propelled scrapers.

You Get Plus Performance with "EUCS"

(Above) Model TD Rear-Dump Euclid. 22 ton capacity . . . 14.8 cu. yds. struck . . . loaded top speed 32.4 m.p.h. . . . powered by 286 or 300 h.p. diesel engine.

(Below) Double-acting twin hoists and entire hydraulic system are of Euclid design and manufacture. Action is fast and positive enabling operator to control body position at all times.

REAR-DUMP EUCLIDS are engineered and built for lasting strength. Their ability to stay on the job, day after day and year after year, means more tons moved at lower cost . . . "plus" performance for owners.

"Euc" bodies have extra thick plates reinforced with heavy box section side and bottom supports. The rugged frames are built to withstand the impacts of hauling and dumping big loads . . . they're built to take the pounding and wear of loading earth, rock and other heavy excavation by large shovels and draglines.

Rear-Dump "Eucs" have many other "plus" features that make them standard equipment in mines, quarries and on construction work. For example, they have large capacity, ample power and traction for steep grades . . . speed on the haul road and full-floating, double reduction planetary type Euclid axle.

For information on equipment that is job proved on work similar to yours, get in touch with your Euclid Distributor or write direct for literature on the complete line of Euclid models.

The EUCLID ROAD MACHINERY Co., CLEVELAND 17, OHIO

CABLE ADDRESS, YUKLID. CODE: BENTLEY

EUCLIDS *Move the Earth*

Block Path of Coal Fire

DURING the past three years a desperate fight has been going on in the west to save precious coal reserves from underground fires that are sometimes more destructive than the blazing forest fires that devastate great timber areas.

Some of these fires have been burning for as long as 40 years, ruining valuable grazing and timberland. Last year an explosion in one abandoned coal mine, which has been smoldering for 40 years, set a major forest fire on the south slope of Grand Mesa in western Colorado. More than 3,000 acres of brush and pinion were burned before the fire was controlled.

Private contractors, under the direction of the United States Bureau of Mines, are saving millions of dollars worth of coal deposits under public land using road contractors' methods to extinguish the fires.

J. H. East, Jr., regional director of the Bureau of Mines at Denver, Col., estimates that 96.5 million tons of coal have been saved in Wyoming, Colorado, and New Mexico at the cost of approximately ½c a ton during the past three years.

One of the typical underground coal-fire-fighting projects is located at Skull Creek, 70 miles west of Craig, in Colorado's Rio Blanco county. The Paul Hunt Construction Co. of Steamboat Springs, Col., raced early fall snows to complete work on their $24,864 contract. The Skull Creek fire, burning on public domain for some 15 years, required about 96 hours of preparatory bulldozing, the excavation of 60,000 yards of material, and the placement of 30,000 yards of compacted fill.

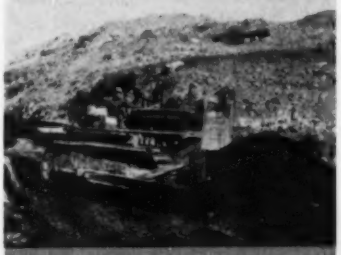
The method employed at Skull Creek is similar to that used by road contractors in constructing a cut or fill through mountainous country. A trench is excavated through the material containing the coal, isolating the fire in the center. This trench, several hundred feet long, about 100 feet across at the top, and about 25 feet at the bottom, is then backfilled with clay or other noninflammable material and compacted. Hunt is using an International TD-24 crawler tractor and Bucyrus-Erie cable bulldozer to dig the trench through the slatey rock material containing the coal. An International TD-18 and LeTourneau scraper are then used to move the excavated material out of the trench.

• Paul Hunt Construction Co. builds earth fire wall across coal seam with tractor equipment. International TD-24 crawler with Bucyrus-Erie cable dozer and TD-18 with LeTourneau scraper handled the $24,800 job for U. S. Bureau of Mines.

The coal fire which has been isolated is burning at a depth of 80 feet. Therefore, it is necessary to cut and fill below this depth to stop the fire.

It is estimated that this one project alone will save 2½ million tons of bituminous coal. An estimated forty fires are still burning in inactive coal deposits in the public domain of the states of Wyoming, Colorado, and New Mexico. But only the Padlock fire near Gillette, Wyo., is being isolated in addition to the project at Skull Creek. The Padlock project will save an estimated 15 million tons of coal.

Colorado contractor, Paul Hunt Construction Co., cuts trench through coal bed, then backfills with clay to stop underground fire.

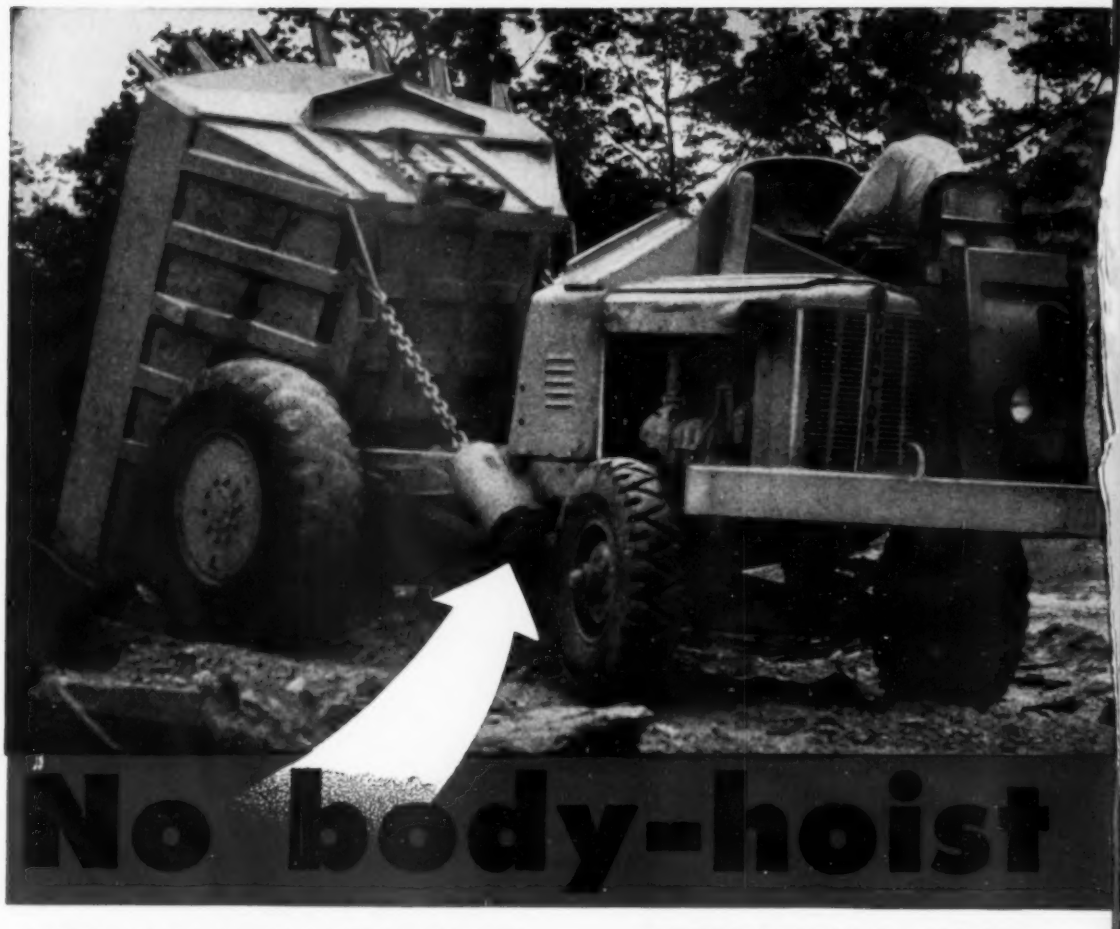


• TD-24 moves inflammable coal out of trench. Compacted clay will fill cut and isolate fire when it reaches barrier.

Other methods used to fight coal fires are by surface sealing and silt-flushing. The most common is the surface-sealing method. This involves spreading a blanket of earth about 10 feet thick over the burning area with bulldozers and other equipment to exclude oxygen from the flames.

The other method is used in snuffing out fires in abandoned underground workings and involves flushing silt into the burning workings through boreholes.

Congress authorized fire-control work in 1949. Under the provisions of its act, fires on public domain are controlled at the expense of the federal government. However, if the fire is on private land, or county land, the landowner must provide ⅓ of the cost of the control work.



No body-hoist

CUTS MAINTENANCE COSTS . . . SPEEDS HAUL CYCLES

Koehring Dumptors have no slow-working body hoists. Trip the release lever and gravity dumps the 6-yard load in one second. It's as simple as that! No complicated mechanical hoists to slow up haul cycles . . . no expensive replacement parts, costly hoist maintenance or down time to eat into your profits. And gravity dump is instantaneous and trouble-free in all temperature extremes . . . never wears out.

No costly spring maintenance is another money-saving advantage you get with Koehring Dumptors. There is just one big, double-coil chassis spring on steering axle . . . none on driving axle. Extra-big, shock-absorbing drive tires eliminate need for more. You save spring maintenance time and replacement costs.

Check your body hoist and spring maintenance costs for a year . . . see how much you'll save by using Dumptors. What's more, Dumptor's no-turn shuttle haul and constant-mesh transmission for 3-speed travel forward and reverse, increase production . . . and your profits. See your Koehring distributor now for all the facts . . . or send today for the informative 28-page Dumptor catalog.

KOEHRING CO., Milwaukee 16, Wis.

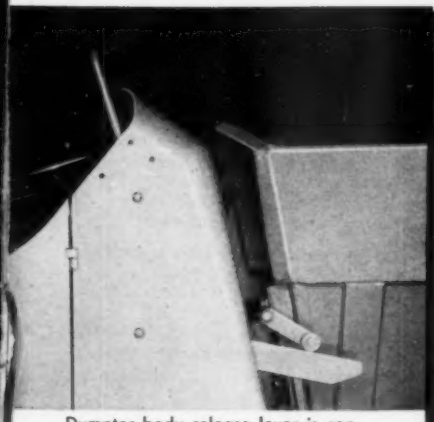
Subsidiaries: KWIK-MIX • JOHNSON • PARSONS

CK121

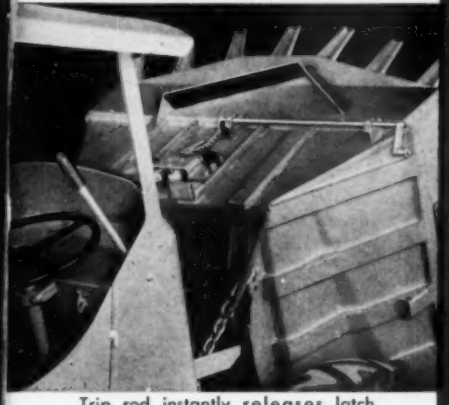
KOEHRING HEAVY DUTY

KOEHRING DUMPTOR

CRANES UP TO 79½ TONS LIFT CAPACITIES . . . EXCAVATORS UP TO 2½ YARDS



Dumptor body release lever is conveniently located alongside steering wheel . . . there's no reaching or stretching necessary . . . trip lever engages trip rod on body.



Trip rod instantly releases latch hooks from latch seat on chassis frame . . . and gravity dumps the load. Latch automatically locks as body returns to loading position.

Scoop-shaped Dumptor body rolls on heavy-duty rockers. Snub chains are attached to big, coil-spring shock absorbers, which check the body at approximate 70 degree tilt.

JOHNSON *big-payload* CLAMSHELLS

Fast-cleaning

. . . smooth, inside and out, Johnson all-welded clamshell buckets dig and dump with least resistance. They are quick-filling, easy-closing because big needle-bearing-mounted sheaves reduce friction, loss, deliver full digging power to lips, teeth. Hard manganese cutting edge toughens with use, assures capacity payload every bite.

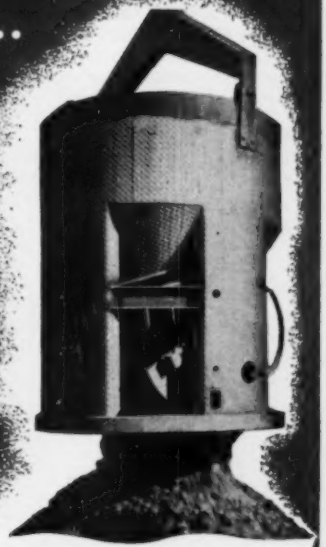
3 TYPES, 10 SIZES . . . ½ TO 3 YDS.

General-Purpose, Wide-Reach-Rig, Heavy-Duty-Digging types . . . 10 sizes from ½ to 3 yds. offer maximum positive performance, long life on all of your digging jobs.

LO-SLUMP.....

CONCRETE BUCKETS

handle any stiffness of concrete, have built-in air vibrator, steep interior slopes. Extra-large, double-clam discharge gates can be operated manually, or by air rams. Sizes: 2, 3, 4, 6 and 8 yds., all engineer-approved. 8-yd. Johnson Lo-Slump is available with single compartment, or two 4-yd. compartments with independent dual discharge arrangement. Johnson line also includes many other bucket sizes, types for large aggregate concrete and normal slump concrete, etc.



FOR COMPLETE FACTS, WRITE TO:
C. S. JOHNSON CO., Champaign, Ill.

☐ Send us new clamshell bucket catalog. ☐ Send information on concrete buckets.

NAME _____ TITLE _____

COMPANY _____

STREET _____

CITY _____ STATE _____

EE

C. S. JOHNSON COMPANY
Champaign, Illinois

KOEHRING SUBSIDIARY

Hess Urges Preventive Maintenance

by Ray Day

FEW users of equipment are getting the performance and long operating life they should get out of their machines. Not more than half the operators of modern equipment know what a real preventive maintenance program can accomplish. And engineers of state, city and county highway departments should lead the way toward development of preventive maintenance programs covering each of their departments.

So said Harold F. Hess, executive vice president of the Construction Industry Manufacturers Association, addressing the Fourth Annual California Street and Highway Conference at the University of California in Los Angeles. Hess urged the assembled engineers to form a committee to collect all the available data on preventive maintenance from city, state, and county governments in California, to blend it with manufacturer's literature into a technical report, and to conceive from that an outline for each official to follow in developing his specific program.

Amazing results can be accomplished with a real program, Hess said, and he told how Peter Kiewit Sons Co. of Omaha—one of the nation's leading contractors—had boosted the operating time between overhauls of heavy equipment from 4,000-5,000 hours to 8,000-10,000 hours. Quoting Jim Symonds, Kiewit's equipment superintendent, Hess said the program paid off "not only in a saving of over-all costs, but in twice the equipment service between overhauls."

● Harold F. Hess, executive vice president of CIMA, asks delegates to the University of California engineering meeting to pay better attention to preventive maintenance programs for equipment under their jurisdiction.

Suggestions Pinpointed

Hess clearly outlined his suggestion by pinpointing the details in two sections, as follows:

FIRST, he said, determine exactly what your own preventive maintenance program should cover, for example:

1. Purchasing the right equipment for the job.
2. Planning the proper unloading of new equipment.
3. Planning the proper assembly of new equipment.
4. Complete and careful servicing prior to placing the new equipment in operation.
5. Proper loading, blocking, and unloading equipment during movement from one job to another.
6. Proper storage, especially in bad weather. (Hess told how new equipment on the Eden Parkway near Chicago stood exposed to snow and rain all winter without even exhaust-pipe protection.)
7. Proper handling on the job, by competent operators.
8. Development of a specific maintenance program for each type of equipment, with proper check lists and reporting forms.
9. Prompt repair of defective parts before major damage takes place.
10. A definite overhaul program after a certain number of hours of service.

SECOND, and probably the most important requirements for establishing an adequate maintenance program is that of *organization*, and Hess suggested a detailed plan as follows:

1. Make one person responsible for establishing a preventive maintenance program and executing it.
2. Give this man who carries the responsibility the authority to select adequate and capable manpower and to pay them what they are worth.
3. Make check charts of all periodic

inspection points. (Hess suggested using manufacturer's check charts for this.)

4. Make up a schedule of periods for checking the necessity of proper adjustment, necessary replacements, and correct lubrication.

5. Stock an adequate supply of spare parts, properly identifying them and providing adequate housing for them.

6. Procure necessary tools for performing necessary maintenance service.

7. File manufacturer's operating, maintenance, and parts manuals in a quickly accessible location.

8. Make the recommendations of the manufacturer a part of your preventive maintenance program.

9. Stock adequate supplies of proper grades of lubricant in clean surroundings. Properly label each type of lubricant for the various points used.

10. When operating away from home maintenance facilities, establish manufacturers' representatives' qualifications for rendering technical and repair service and for providing spare parts.

Hess then tied preventive maintenance to the current steel shortage, and urged all users of equipment to build a program now and to keep it in perpetual operation from now on, regardless of the state of world affairs. The establishment of any maintenance program will depend not only on having a good program, he said, but also to a large extent on how well the program has been sold from the top of the organization down through to the operators and mechanics.

"Actually, the sin of equipment abuse is traceable to a failure to appreciate what information is already available," Hess said. "No extensive research work need be done. There is a great deal of help and assistance available to the user of construction machinery and allied equipment. Every machine is accompanied by a set of manuals covering loading, unloading, assembly, operation, repair, care, and maintenance.

"In addition, the user has the opportunity of taking advantage from time to time of service and operator's schools put on by the manufacturers and their distributors.

"Manufacturers' manuals and booklets are not always placed in the hands of the right individual," the CIMA executive said. "Many wind up in the purchasing department's files. Many times the superintendent or shop foreman has them well hidden. To a major degree we find that the mechanics and operators and oilers never see the instruction books. Not having an instruction book they have nothing to guard against, and consequently they feel their way in the darkness."

Steel Shortage Told

The steel shortage is affecting not only the new equipment manufacturer, but highway departments as well, said Richard H. Wilson, assistant state highway engineer of the California division of highways. Highway departments over the nation received only 1% of total U. S. steel output in 1951, he said, but they need a minimum of 2% in 1952 if road construction is to keep pace with the demand for new highways.

Wilson said the California division of highways now has over $150 million worth of new construction work under way, and while no actual shut-downs of contract work have been made due to steel, the situation is getting more and more critical. Steel shapes and plates are the hardest items to get, he explained, and copper wire for signal fixtures is especially difficult to get under the usual state "J" priority. He urged highway engineers to screen and redesign projects, if necessary, to eliminate some of the need for critical metals.

Details of the new bituminous test road on U. S. 191 north of Malad City, Ida., were told by Fred Burggraf of the Highway Research Board, who said that a 90-day construction contract would be let so work could start by the 1st of April. The purpose of the $189,000 project is to determine by actual traffic loading tests the behavior of various bituminous road designs. Testing, which will start about Sept. 1, 1952, will differ primarily from the LaPlata, Md., concrete road test in traffic direction. The Idaho test will make use only of one-way traffic, and there will be continuous turning loops at either end of the 1,900-ft. tangents.

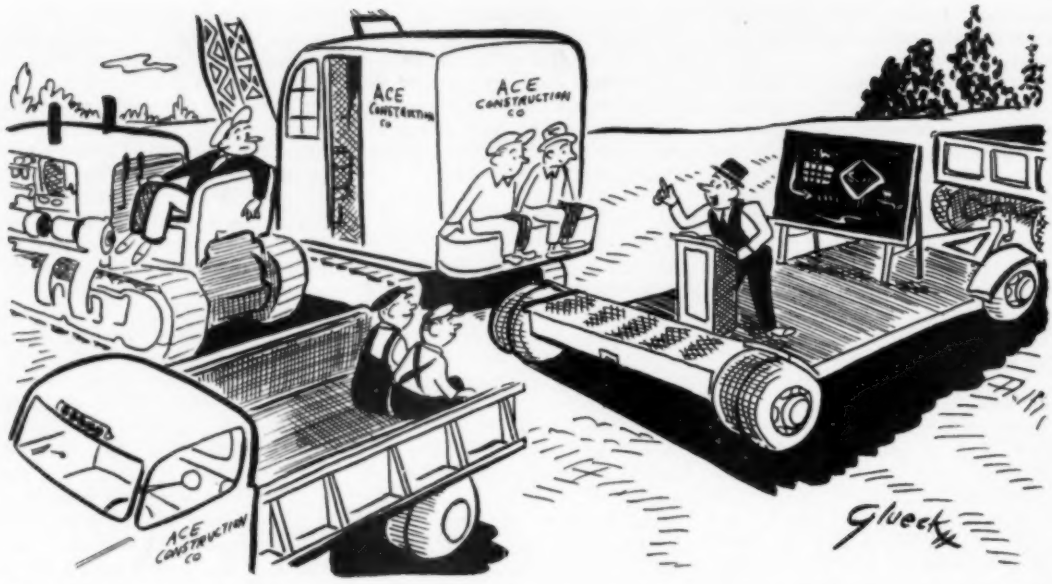
Approximately 375 delegates from California and various other parts of the west attending the meeting, which commanded national prominence because of technical engineering tests now conducted regularly by the Institute of Traffic and Transportation Engineering.

Dewatering 1500' of 8' x 14' deep sewer trench at a river crossing, this 4" Jaeger pump handled 40,000 gph at average speed of only 1200 rpm (10% to 15% lower speed than other pumps), and reprimed quickly, as needed, at 1400 rpm (compared with 1800 to 2000 rpm required to prime ordinary pumps). This is typical performance. Jaeger's larger shells and impellers, double priming action and use of largest engines applicable mean high efficiency, fuel economy, long life — in 1½" to 10" pumps.

See your Jaeger distributor or send for Catalog P-10

THE JAEGER MACHINE COMPANY 553 Dublin Avenue, Columbus 16, Ohio

COMPRESSORS • MIXERS • HOISTS • TOWERS • PAVING MACHINERY



• Thorough preparation makes a good instructor.

Practical Safety Training for Small Organizations

by Chas. R. Zeskey, Jr.*

Here are a few practical suggestions to make the small contractor's safety program more effective. This material was presented at the National Safety Council meeting.

WHETHER or not a training program is practical depends entirely on the particular conditions which exist in the organization where the program is to be put into effect. What may seem practical for one outfit may be quite impractical for another. In spite of this, however, it seems to me that there are three main elements of any training program which are important whether the educational work is at the college level or if it is to be carried on at the operations level. These elements are good instruction; good subject material; and a suitable place for the instruction to be given.

Good instruction requires thorough preparation. A safety training program is going to be no better than the quality of its instruction. The safety engineer or the foreman who appears before a group of employees to instruct them even on such an elementary subject as the wearing of goggles, and who fails to prepare his talk in advance is bound to lose the confidence and respect of his audience sooner or later.

The job of the company's safety engineer in the training program, it seems to me, should be something like this: He must first sell the chief operating executive on the idea. This is a training job in itself for if this executive has been untrained or poorly trained in accident prevention work, the safety engineer must be very carefully and thoroughly prepared on his subject material before he tackles the job. Then, with the help of the safety engineer the big boss is responsible for training his superintendent.

Responsibility Differs

How much responsibility rests with the safety director or with the person who is in charge of safety, depends entirely on whether he is a staff or line executive. In a small organization he may be a foreman, and his job of training the superintendent will require the wholehearted help and backing of the chief executive. The superintendent should then be responsible for training his foremen, again with the help of the safety director or the safety engineer.

The final job, helping the foreman train the line employees, is where most training programs start and where a great many of them fail. Unless the foreman and superintendent, and the big boss himself, have been well trained and instructed, the time spent in training the employees is bound to be largely wasted.

In my opinion, it is impossible to overstress the importance of thorough preparation in each step of the training process. A good instructor must be interested in his subject and must know it thoroughly. He does not have to be a good public speaker, but he must be able to get the idea across to his audience that he knows what he is talking about and has the authority to pass his knowledge on to them.

The second element of any training program is certainly good subject material. Just exactly what subjects are to be covered in a training program is again a question which can be answered only with reference to one particular organization and the nature of the work underway. In any case, the man in charge of the training should develop his curriculum logically so that the

*Chief Eng., T. H. Martin & Co., Kansas City, Mo.

training will be progressive and remain interesting to the employees who will remain on the payroll from year to year. He must also foresee the need for preparing a cycle of training which will apply to those employees who come and go, and who are, in general, responsible for much of the bad accident experience in industry.

It hardly seems necessary to go into any great detail on where this instructional material can be obtained. Even aside from the many pamphlets, sound slide films and other information issued by the National Safety Council, each National Safety Congress provides a gold mine of first class instructional material. In addition to this, of course, there are casualty insurance companies, federal and state departments of labor, and trade associations.

Select Comfortable Site

As in the case of the first two elements of a good training program, no definite specifications or recommendations can be made in connection with a proper meeting place. In some cases, this may be the tail gate of a truck or the superintendent's office. It might be the tool room or even under the shade of a convenient elm tree. In any event, it should be appropriate, and due consideration should be given to the type of instruction which is to be given and the comfort of the employees.

As I mentioned a few minutes ago, some thought should certainly be given to the question of who needs training. A certain percentage of your employees can be depended upon to show up for work day after day and month after month. Perhaps this is 50% and perhaps it is 90%. The remaining 10% or 50% are the drifters down to a warmer climate when the wind starts getting cold. Any training program must be flexible enough to include both of these groups.

Very little that is new can be said on the subject of training programs. The basic principles have existed for years, and the programs which have followed these principles have been successful. The failures have resulted when these principles were ignored. The safety engineer or safety director has available all the necessary tools and materials to solve this problem as well as nearly all the others which he may encounter. The wise safety man will avail himself of these tools which, if used properly, will assure him of success in his work.

Can you use these
4 ADVANTAGES
of HERCULES
Flattened Strand
wire rope?
1. 10% Stronger
2. Proportionately Safer
3. Longer Lasting
4. Easier on Equipment
Have you experienced the extra advantages of Hercules* Flattened Strand wire rope?
Where properly applied, this exceptionally strong, durable rope produces amazing results. Some users report more than three times the service, compared with ordinary rope.
Hercules Flattened Strand packs more steel than any other construction. It spreads wear over four wires of each strand — not just one. It runs smoother. It lasts longer. It reduces groove wear. It increases safety factors in almost direct proportion to its extra strength.
It will pay you to find out!
Now, more than ever, the extra economy of Hercules Flattened Strand really pays off. Ask your Leschen wire rope specialist about it.
*Reg. U.S. Pat. Off.
LESCHEN WIRE ROPE
Flattened Strand • Non-Rotating • Slings
Preformed • Round Strand • Locked Coil
A. Leschen & Sons Rope Co., St. Louis 12, Missouri.
In business only to make wire rope — better wire rope — since 1857.
DISTRIBUTORS IN ALL PRINCIPAL CITIES

News from the Field

Equipment Distributors Elect Hush 1952 President

Harry J. Hush, vice president and secretary of Griffin Equipment Corp., New York, has been elected 1952 president of Associated Equipment Distributors, the national trade association of the construction equipment industry. Hush succeeds R. L. Arnold, Arnold Machinery Co., Salt Lake City, Utah.

The election of officers was part of the business activity of the 33rd annual meeting of Associated Equipment Distributors. More than 2,600 American and Canadian construction equipment distributors and manufacturers attended the five-day meeting.

Hush's election to the presidency culminates a rapid rise in the association. During 1951 he served as executive vice president, and in previous years has held the offices of vice president and director of region II, which embraces the states of New York and New Jersey.

A 1925 graduate of Fordham University, Hush has been with Griffin since 1934. Prior to 1934, Hush was with his father's company, H. J. Hush, Inc. Between 1925 and 1928, he was with Consolidated Edison Co. of New York.

Other officers elected include S. John Oechsle, Metalweld, Inc., Philadelphia, executive vice president; G. W. Gagel, Machinery & Supplies Co., Inc., Kansas City, Mo., vice president; Frank Skidmore, Contractors' Machinery & Supply Co., Albuquerque, N. Mex., vice president; J. G. G. Morgan, Vancouver Equipment Corp., Vancouver, B. C., vice president; and E. J. Crosby, Hedge & Mattheis, Boston, treasurer.

Riggers PLAY IT SAFE on "high wire" jobs!

... that's why they demand GENUINE

CROSBY CLIPS

Drop-forged, hot-dip galvanized wire rope fasteners

SIZES FOR ⅛" TO 3" WIRE ROPE

DISTRIBUTORS EVERYWHERE

AMERICAN HOIST & DERRICK CO.
ST. PAUL 1, MINNESOTA

Matches Promote Safety

A new tool for keeping the safety program in front of the worker on and off the job is the National Safety Council's safety message book matches.

There are six different match covers, each dealing with one aspect of the plant safety program. The subjects on the covers are: warning signs, protective equipment, first aid, alertness, keeping walkways clean, and alibis.

Installed in "help yourself" boxes—by time clocks, in rest rooms and smoking areas, and near drinking fountains—or placed in cigarette vending machines in the plant, these safety matches are an effective, inexpensive safety education tool.

The member price is one case (2,500 books packed in cardboard boxes of 50 books) for $16.25, federal excise tax and freight included.

Vice Presidents Named by Brown & Root Inc.

The addition of three new vice presidents representing a total of sixty years with the company was announced by Herman Brown, president of Brown & Root, Inc., Houston contractors.

They are Louis H. Durst, construction manager for the Houston area; G. Hinman, manager of the oil field department and C. F. Horton, manager of transmission and pipe line projects.

Durst, whose nickname "Preacher" was acquired at A. & M. College is a native of Crockett, Tex. and has been with Brown & Root since 1928. He organized the company's purchasing department in 1941 and supervised all of purchasing of yard machinery and material for the construction of Brown Shipbuilding Co. yard, as well as for the Houston Shipbuilding Corp. yard.

• The oldest and newest Cummins dealers meet. On hand to welcome Raymond H. Snyder, (right), into the engine company's dealership organization, were, (left), R. P. Meehan, Watson & Meehan, San Francisco, who heads one of the oldest dealerships, and L. W. Beck, Cummins vice president of sales. The scene of the meeting was at the factory in Columbus, Ind. Snyder recently purchased certain assets of the Chicago operation of Cummins Diesel Sales Corp. and will operate these facilities as an independently owned dealership.

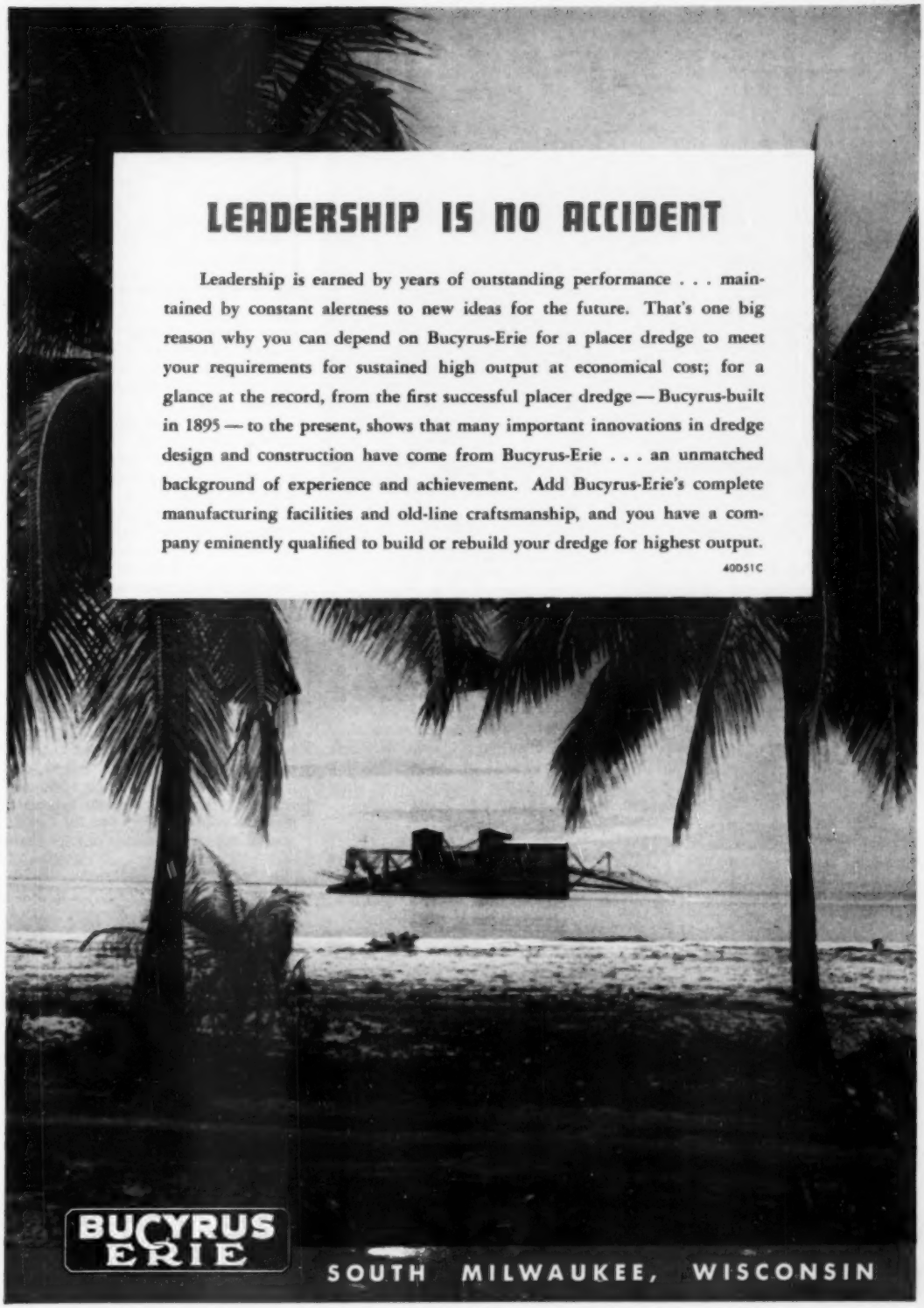
Hinman, a native of Ranger, Tex., attended Rice Institute from 1931-32. He played football for the Owls. Most fans will remember him as "Ox" Hinman. He joined Brown & Root in 1933 and is in charge of the company's big oil field department, handling all types of heavy construction both on land and water on the Texas and Louisiana gulf coast.

Horton was born in Dallas and received his degree in Civil Engineering from Massachusetts Institute of Technology in 1930. He came to Brown & Root in 1935 in the road and street department. He spent a year as general engineer in charge of the Caracas, Venezuela office of Brown & Root and later was project manager of the Kingsville Air Base, Concho Airfield, and the Naval Air Base at McAlister, Okla. Since 1949 he has been in charge of the firm's pipe line work.

No-Injury Records Climb for Open Pit Operations

A steady increase in the number of man-hours worked without a lost-time injury by various open pit mines and quarries is one sign of progress in reducing injuries in these operations. Not so many years ago a record of 1 million continuous man-hours without a lost-time injury was considered exceptional but the records of today are much larger.

The Mahoning and Embarrass


LEADERSHIP IS NO ACCIDENT
Leadership is earned by years of outstanding performance . . . maintained by constant alertness to new ideas for the future. That's one big reason why you can depend on Bucyrus-Erie for a placer dredge to meet your requirements for sustained high output at economical cost; for a glance at the record, from the first successful placer dredge — Bucyrus-built in 1895 — to the present, shows that many important innovations in dredge design and construction have come from Bucyrus-Erie . . . an unmatched background of experience and achievement. Add Bucyrus-Erie's complete manufacturing facilities and old-line craftsmanship, and you have a company eminently qualified to build or rebuild your dredge for highest output.
40D51C
BUCYRUS ERIE
SOUTH MILWAUKEE, WISCONSIN

Mines operated by Pickands Mather & Co. recently established two new top marks for open pit mines and quarries. The Mahoning Mine employing 274 men worked 2,075,477 man-hours from Jan. 20, 1948 to Oct. 30, 1951, for the best record known to the National Safety Council.

The Embarrass Mine employing 335 men holds the second best record by working 1,931,421 injury free man-hours from April 29, 1948 to Feb. 28, 1951.

A third mine, the Sagamore Mine employing 106 men has worked since June 20, 1944 to the present time without a lost-time injury and accumulated 1,513,929 man-hours. This record is noteworthy because of the size of the property and a long period of over 7½ years without a lost-time injury.

Venezuelan Superhighway Pushes Through Mountains

Earthmoving operations on one of the most ambitious road building projects in South America, the 11-mile scenic superhighway connecting Caracas, capital of Venezuela, with the seaport of La Guaira, is now at the halfway mark.

Sixteen International TD-24 Diesel crawlers operating with Bucyrus-Erie winches, Bullgraders, and four-wheel scrapers have thus far performed a major share of the cutting and filling required to build the $55 million four-lane highway. Construction started in January, 1950, and is scheduled to be completed at the end of 1953. Eight other International TD-24 crawlers originally placed on the construction project were shifted for emergency reasons to other highway sites to clear landslides caused by heavy rains. Besides the TD-24's, four model TD-18's are also used.

● Caution is a prime consideration for the operator of an International TD-24 and Bucyrus-Erie bullgrader combination who is pushing earth over one edge of a Venezuelan mountain while he moves the equipment on a "sidehill" angle. Note the four tractor-scraper teams ahead of the ravine and the Caribbean seacoast in the background.

To date mountainsides have been cut down as much as 198 feet and ravines filled to a depth of 132 feet. Before the project is completed, more than 6 million cubic meters of material, 60% of it rock, will have been moved. Much of this excavation is necessary because the road is being built in a straight line as far as possible through hilly terrain. Although grades on the new highway will be from only 3.5 to 6%, the road bed rises from sea level to an altitude of 3,000 feet within a comparatively short stretch.

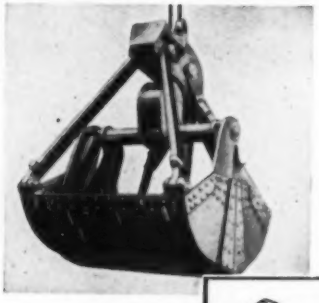
The new superhighway will replace the winding two-lane mountain road which now connects Caracas and La Guaira, cutting down traveling time between the two cities from 60 to 15 minutes. Its construction has a long range bearing on Venezuelan welfare, for a great part of the products coming into the country arrive at La Guaira and must be transported over this route

● Seemingly beyond repair after tumbling down a steep mountainside, this sturdy crawler tractor survived the impact and was back in operation shortly afterwards. Here is visual proof of the danger that is always prevalent in the rugged Venezuelan terrain.

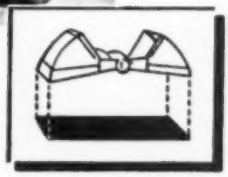
Walter J. Mullally

Walter J. Mullally, sales representative for American Manganese Steel Division of American Brake Shoe Co. died suddenly on the 17th of February. Mr. Mullally joined the engineering department of American Manganese Steel in 1919 and later transferred to the sales department. He was located in Chicago, Ill.

ERIE *Barge Type* Bucket



In this type the large deck area achieved means bigger payloads in stock piling and barge rehandling work. Erie's booklet on 2-line buckets gives you complete data on this type and 3 other classes of Erie Buckets. Write for copy today.



Compare DECK AREA

¾ Yd.	27.21 Sq. ft.
1 Yd.	30. Sq. ft.
1½ Yd.	32.3 Sq. ft.
1½ Yd.	38.7 Sq. ft.
1¾ Yd.	42.4 Sq. ft.
2 Yd.	45.1 Sq. ft.
2¼ Yd.	53.5 Sq. ft.
2½ Yd.	57.6 Sq. ft.
3 Yd.	60.9 Sq. ft.

Write for Catalog 2L-2 *Today*

ERIE
STEEL CONSTRUCTION COMPANY
4211 GEIST ROAD • ERIE, PENNSYLVANIA

to reach Caracas and the rest of the country.

It is expected that the new highway will also help alleviate the traffic congestion which has arisen in the Caracas area during the 10 years from 1941 through 1950 when the population grew from 361,000 to 662,000. Plans recently announced call for continuation of the highway through the urban section of Caracas and the construction of a 1,830-foot twin-tube tunnel connecting it with the projected Eastern Highway, which will run along the Guaire River and lead to the eastern part of the country. All necessary plans for the latter highway have been completed and its construction will begin as soon as the La Guaira-Caracas section is completed.

The new superhighway will have two roadways, each 21 feet wide and separated by a 4-foot strip of grass. Shoulders 8 feet wide will be provided to allow stalled cars to park without blocking traffic. Actual distance covered will be less than half of the present 20-mile road, with only 32 curves planned as compared with 400 now. The minimum radius on curves is to be 1,000 feet.

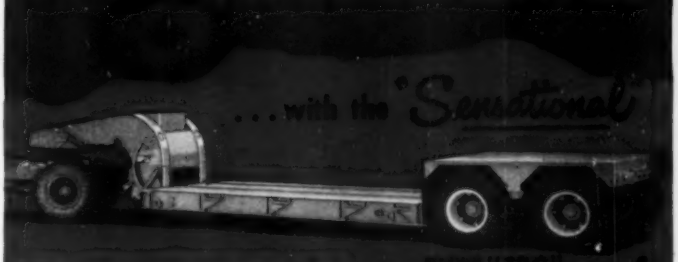
Recent developments include the completion of a 1,445-foot tunnel, the shortest of two twin-tube tunnels being constructed by Morrison-Knudsen of Venezuela. The other tunnel will be 5,900 feet long. Three twin-bore tunnels were planned originally, but the contractors decided to dig under a small open cut which they previously intended to utilize, and present plans call for one long and one short tunnel instead of three short ones.

More than 600 workers were employed in three 8-hour shifts for a period of three months during the construction of the first tunnel. Its walls and ceiling are now being covered with a concrete layer, and later ventilation blowers will be installed by Ralph Smillie of New York. However, the pavement in the tunnel will not be put down until the entire highway is near completion. Six International LF-192 motor truck units with 4-yd. mixer bodies will be used by Morrison-Knudsen for the cement work in the tunnels.

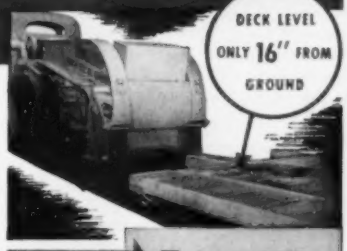
Boring has already begun on the second and longest tunnel of 5,900 feet, which will take approximately 8 months to complete. Cost of the first tunnel amounted to $2,100,000; it is estimated the other will cost more than $12 million.

In addition to the tunnels, three concrete bridges are being constructed to circumvent the mountains and valleys separating Caracas from the sea. The largest bridge, 1,000 feet long and 330 feet high, is almost completed.

LOAD, HAUL and UNLOAD
MORE Heavy Equipment IN LESS TIME



ROGERS TYPE "TPG" Power Lift
DETACHABLE GOOSENECK



● Versatile performance features plus well known Rogers quality construction embodied in work tested design, puts the Type "TPG" Power Lift Detachable Gooseneck Trailer in a class by itself for an "all purpose" single unit.

If you contemplate the purchase of a new trailer, by all means investigate this increasingly popular model. Write for literature today.

Featuring 5 EXCLUSIVE ADVANTAGES

1. Carries heavier loads on larger tires.
2. Detaches quickly for fast, easy front loading.
3. Stoops to clear low overhead obstructions.
4. Raises its deck to clear high banked crossings.
5. Is detached, loaded and reattached in 5 minutes.

THE ROGERS Power Lift DETACHABLE GOOSENECK CAN BE OBTAINED ON ANY STANDARD ROGERS DROP DECK TRAILER

EXPERIENCE builds 'em — PERFORMANCE sells 'em

ROGERS BROS. CORP.
ALBION, PENNA.
136 ORCHARD ST.

"RODGERS I BEAM OR GIRDER TRAILER"

The other two will be 850 and 660 feet long, the latter to have a central arch 450 feet wide.

All cutting and filling on the highway is being done by the Venezuelan

• One of three Caterpillar D386 Diesel electric sets supplying all electric power on main road tunnel construction between Caracas and LaGuaira.

Ministry of Public Works, while the viaducts are being built by the French engineering firm of Campenon Bernard. Venezuelan contractors also connected with the project include Vegas y Rodrigues Amengual C.A., Gil-Rangel-Baquero, C.A. Constructora Stelling-Tani, Bolinaga y Rodenas C.A., Constructora Avila S.A., C.A. Empresa Nacional de Construcciones.

When the road is completed, the right of way, which extends 246 feet, will be landscaped, and posters and advertisements of any kind will be prohibited. The entire length of the highway will be lighted for night traffic by a modern highway lighting system. Present plans call for the collection of a small tax or toll from vehicles.

Beckwith Machinery Names Two to Managerial Posts

William H. Dickey, previously branch manager of Beckwith Machinery Company's Clearfield, Pa. operation, has been named Pittsburgh sales manager for that western Pennsylvania equipment distributorship.

Dickey joined Beckwith in February of 1946 and served as salesman for three counties of Ohio and Lawrence and Mercer Counties in Pennsylvania. In 1948 he was made branch manager at Beckwith's new Clearfield, Pa. location. Dickey replaced Lloyd F. Stamy in the Pittsburgh office.

Walter W. Coldren has been appointed to succeed Dickey at Clearfield, Pa. Coldren joined the company in 1941 as a partsman at the Bradford, Pa. branch. Following a period of service with the military forces he returned to that location and served a year and a half as assistant to the manager.

In 1948 Coldren was made parts store manager at Belmont, O. He was then transferred to the Pittsburgh sales department in 1950.

37,500 Feet of Drill Cores Stored in Unique Library

More than 37,500 feet of drill cores from mining projects in four upper midwest states have been stored in the core storage library of the Bureau of Mines, just south of Minneapolis, since its opening about a year ago.

Only federal depository of its kind serving the minerals industry of the upper midwest, this unique library offers industry and government a free place to store and examine core from mineral exploration projects. Industry in all sections of the country is invited to use its facilities.

Of the 37,628 feet of drill core stored to date in the bureau's library near the Fort Snelling government reservation, 9,518 feet came from Minnesota, 7,402 feet from Wisconsin, 12,986 from Michigan, and 7,722 feet from South Dakota's Black Hills.

Storing the actual core is important because upon re-examination at a later date, it may be found to contain a mineral not originally sought in the first test after drilling. Experience has proved that there is no substitute for the actual core.

The minerals picture is constantly changing, and minerals once thought worthless are suddenly becoming vital to our economy. This was true in the case of radioactive minerals, now essential to atomic energy. Many old drill cores were re-examined and found to contain them.

But many cores could not be re-examined because they had been discarded and lost to the minerals industry forever due to a lack of adequate storage facilities. The core storage library was built to conserve such cores for future study and to eliminate costly drilling again the same spot.

A.G.C. Cites 120 Firms for Safety Records

Progress in the construction industry's campaign to reduce accidents on the job was noted in Detroit where The Associated General Contractors of America made 120 awards for exceptional safety records to member firms.

Comparing these 120 awards to the 88 made last year, the association's officials feel that the A.G.C. safety program is rapidly increasing in effectiveness.

H. B. Alexander, Harrisburg, Pa., chairman of accident prevention committee, reported to the A.G.C. convention that 25% more construction firms reported their safety records in the association's 1951 accident prevention program than in the previous year.

"I believe even more will push for good safety records as they realize the tremendous losses an accident can cost both the worker and the employer," he added.

The severity rate in 1951 dropped substantially in those firms participating in the A.G.C. program—from 78 days lost per lost-time accident in 1950 to 65 days in 1951—a 13-day reduction.

Harry J. Kirk, Washington, D. C., A.G.C. accident prevention director, said, "The construction industry—once branded as one of the most dangerous—has been making encouraging strides in the last few years."

Over 6,100 highway, building, and heavy construction firms belong to the national association.

Six chapters of the Associated General Contractors of America were cited for having the highest percentage of their members reporting participation in the association's accident prevention program. They are: Milwaukee chapter, 100% reporting for the second consecutive year; Dallas chapter, 88% reporting. Ohio highway chapter (Co-

lumbus); Pennsylvania builders chapter (Reading); Michigan Road Builders Association (Lansing); and Detroit chapter.

The best 10-year records in safety in the Building Division were achieved by: H. B. Alexander & Son, Inc., Harrisburg, Pa., Martin L. Bauer Construction Co., Middletown, O., and Woermann Construction Co., St. Louis, Mo.

The best 10-year records in the Heavy Construction Division were achieved by: Maxon Construction Co., Inc., Dayton, O., The Holmes Construction Co., Inc., Wooster, O. and Dravo Corp., Pittsburgh, Pa.

The Maxon firm has run up an exemplary record with both frequency and severity of accidents far below the national average—in spite of having an exposure of almost 62 million man-hours last year.

Thirteen A.G.C. firms were honored for having the best five-year records. The winners are as follows in first, second, and third place order:

Building Division—Group A—Contractors with above average exposure of 2,126,035 man-hours; Kroening Engineering Corp., Milwaukee, Wis., A. L. Jackson Co., Chicago, Ill., and Ritter Bros., Harrisburg, Pa. Group B—Contractors with below-average exposure of 2,126,035 man-hours; Bauer-Schoeneck Constr. Co., Milwaukee, Wis., R. S. Noonan, Inc., York, Pa., and Thomas H. Bentley & Son., Milwaukee, Wis.

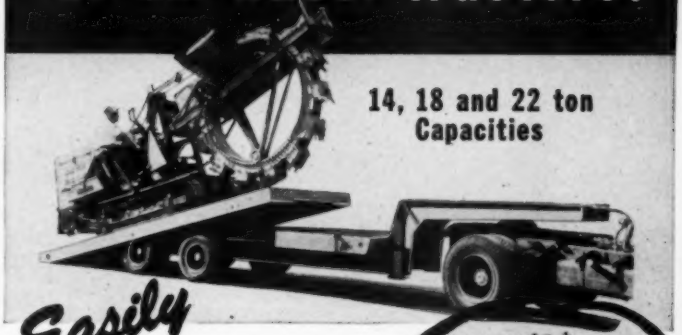
Highway Division—Burrell Constr. & Supply Co., New Kensington, Pa., The O'Neil Constr. Co., Havre, Mont., (and tied for third place) A. J. Baltes, Inc., Norwalk, O., and Colglazier & Hoff, Inc., San Antonio, Tex.

Heavy Division—Herbert F. Darling, Williamsville, N. Y., Henry L. Horn, Caldwell, Ida., and E. C. Machin, Inc., Allentown, Pa.

Another 1950 record was topped in 1951 when 78 firms posted no lost-time accident reports. They are:

Building Division — L. G. Audish, Houston, Tex., Bock Constr. Co., Dallas, Tex., Thomas P. Brennan, Inc., Dallas, Tex., J. L. O'Rouke & Son, Dallas, Tex., Peterson Constr. Co., Dallas, Tex., Berretta Constr. Co., Exeter, Pa., F. J. Cuppels, Kingston, Pa., Guy J. Hafer, Chambersburg, Pa., S. G. Mastriani Co., Scranton, Pa., Brown Const., Co., Houston, Tex., Hickey & Co., Dallas, Tex., Howard Constr. Co., Houston, Tex., J. C. Plank, Houston, Tex., Thrash Constr. Co., Houston, Tex., Bauer-Schoeneck Co., Milwaukee, Wis., Robert L. Reisinger & Co., Milwaukee, Wis., Stack Constr. Co., Milwaukee, Wis., Central Engineering Co., Davenport, Ia., J. Lawrence Jones, Dallas, Tex., Moore

NEW TILTING TRAILER
for 5th wheel tractors!



Easily
loaded and unloaded
in 5 min. by 1 man!

Here at last is a *practical* heavy-duty tilting trailer, embodying the famed La Crosse *"double-strength" gooseneck*, for hauling big trenchers, shovels and other equipment behind standard 5th wheel tractors. Eliminates need for skids and blocking . . . saves hours of labor on every move. Operator simply tilts trailer platform to ramp position . . . drives or winches equipment into place . . . and he's ready to go in 5 minutes, with *platform automatically leveled and locked for traveling.*

Available in 14, 18 and 22 ton capacities, this new GTTA Tilt Top gives you all the advantages of job-proved La Crosse construction, including: "uni-built" subframe, hydraulic cushioned platform control, "walking beam" axle supports, big constant rise S cam brakes, and extra wide base rims for longer tire life. Write today for complete details, including facts on La Crosse *draw-bar-type* tilt trailers, and custom-built La Crosse low beds up to 67 tons capacity.

LC-24

Check Today!

LA CROSSE TRAILER CORPORATION, La Crosse, Wis.

Rush complete information on La Crosse trailers:
☐ Gooseneck Tilt ☐ Draw-bar Tilt ☐ Standard Low Bed
☐ Send name of nearest La Crosse Distributor.
☐ We may buy a ..... ton trailer about ..... (date)
Name..... Title.....
Employed by..... .....
Address.....
City..... State.....

LaCROSSE
America's Favorite LOW BED TRAILER

• In Denver, Colo., Thomas Bate & Sons are using their Manitowoc Speedcrane to dig excavation for 72-in. storm sewer addition. A Caterpillar D13000 Diesel engine supplies power.

& Moore, La Porte, Tex., Robt. E. Nesmith, Inc., Houston, Tex., W. H. Wallace Constr. Co., Dallas, Tex., W. E. Woodruff Co., Houston, Tex., Viggo M. Jensen Co., Albert Lea, Minn., Kenill Constr. Co., Charleston, W. Va., Kucharo Constr. Co., Des Moines, Ia., Leto Constr. Co., Detroit, Mich., Nanticoke Constr. Co., Nanticoke, Pa., J. C. Orr & Son, Altoona, Pa., Ortman & Reitze, Meadville, Pa., H. A. Williams, Inc., Allentown, Pa., Dowling Construction Co., Williamstown, W. Va., W. J. Elliott, McConnelsville, O., E. L. Harris & Son., Charleston, W. Va., Quinn & Conant, Los Angeles, Calif., Stibbard Constr. Co., Detroit, Mich., John C. Westphal Co., Detroit, Mich., and Gene Hurley Constr. Co., St. Paul, Minn.

Highway Division — Carothers & Dahlstrom, Fremont, Mich., Crossman-McCoy, Inc., Sodus, Mich., Drainage Contrs., Inc., Dearborn, Mich., General Paving Constr. Co., Grand Rapids, Mich., Mott Constr. Co., Centerville, Ia., Eben Van Dusseldorp, Colfax, Ia., M. O'Herron Co., Pittsburgh, Pa. J. C. Orr & Son, Altoona, Pa., John K. Jackson, Ironwood, Mich., A. Lindberg & Sons., Ishpeming, Mich., Paul C. Miller, Comstock Park, Mich., Harry Pickitt, Allegan, Mich., J. T. Ryan, Oelwein, Ia., Joseph H. Goss, Newark, O., S. E. Johnson Co., Maumee, O., Diesch Constructors, Waterloo, Ia., Dixon Bros. Co., Correctionville, Ia., Gillotti Constr. Co., Des Moines, Ia., Kehe Constr. Co., Waverly, Ia., Dale Upham, West Union, Ia., Koski Constr. Co., Ashtabula, O., and O'Neil Constr. Co., Havre, Mont.

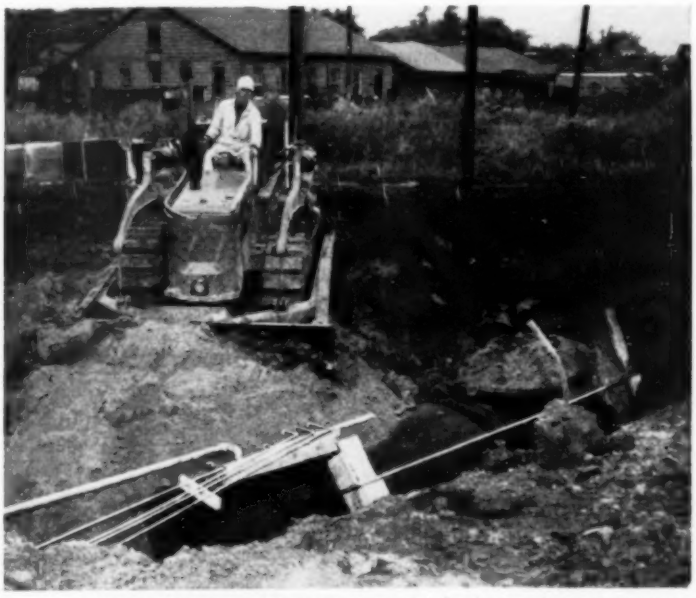
Heavy Division—Drainage Contrs., Inc., Dearborn, Mich., Fry & Kain, Lansing, Mich., C. F. Replogle, Circleville, O., Robertson-Henry Co., Huntington, W. Va., Elmer Vogt, Inc., Massillon, O., Ankrom & Castin, Parkersburg, W. Va., Geo. Carlson Co., Milwaukee, Wis., Kehe Constr. Co., Waverly, Ia., Gerald Mora, Houston, Tex., Freeland Constr. Co., Pittsburgh, Pa., Jas. H. McQuade & Sons Co., Pittsburgh, Pa., J. C. Orr & Son, Altoona, Pa., and Reason Constr. Co., Pittsburgh, Pa.

Cunningham-Ortmayer Co. Gets New Owner

Henry J. Adams, sales engineer for Iowa Manufacturing Co., Cedar Rapids, Ia., resigned that position on the 15th of February to engage in his own business. After eight years with Iowa, Adams has assumed the ownership and operation of Cunningham-Ortmayer Co., well-known Milwaukee distributor.

As a new distributor, still operating

RENT INTERLOCKING STEEL SHEET PILING
"FASTER from FOSTER"
ALL LENGTHS & ALL SECTIONS TO MEET ALL YOUR JOB NEEDS
Foster's lower rental rates on all standard piling sections give you a low fixed expense as an added competitive advantage when bidding on jobs. You can always count on reliable service! RENT: Pile Hammers and Extractors.
Send for: Piling Chart EE-4
L.B. FOSTER CO.
PITTSBURGH 30, PA.
NEW YORK 7, N.Y.
CHICAGO 4, ILL.
HOUSTON 2, TEX.



• An old tank car will be the oil storage tank for the new Chicago Great Western passenger and freight station in Fort Dodge, Ia. Here an International TD-9 with Bucyrus-Erie dozer buries the tank, with owner W. E. Van Alstine at the controls.

under the name of Cunningham-Ortmayer, Adams will continue to serve the entire state of Wisconsin with leading lines of construction and road-building equipment. Sales and service headquarters will still be located at 1229 S. 41st St. in Milwaukee, with a branch in Green Bay, Wis.

Expect 1954 to See Finish of New York Thruway

With planning under way on all sections of the 535-mile New York State Thruway, the project will be completed by 1954 unless there is a worsening of the international situation, the State Thruway Authority declared in its second annual report.

More than 2,400 engineers are engaged in advancing all phases of the planning and construction, according to the report. These include the staffs of 35 consulting engineering firms, as well as engineers of the state Public Works Department.

The report gave the status of construction and planning, as of Dec. 31, 1951 as follows: Opened to traffic, 41 miles; to be under construction contract by next March 31, 109 miles; plans in various stages of completion, 267 miles; field surveys completed and in progress, 118 miles.

Despite steel shortages that had delayed schedules, particularly in the building of overhead structures, the authority reported that "new construction is now being placed under contract rapidly."

The report noted that it would be necessary to complete all planning in a year from now to allow two full years for the construction phase.

Sufficient steel was obtained last year to complete 48 overhead bridges and to start the construction of 24 more. Plans were completed for 59 more and were being prepared for 133 others, a total of 264.

Award Foundation Contract for Kansas Dam

A Bureau of Reclamation contract to initiate construction of Kirwin Dam on the north fork of the Solomon River, Phillips County, Kan., has been awarded to the Cook Construction Co. of Jackson, Miss., on a low bid of $1,226,246. The initial contract is for the excavation of the foundation of the dam.

The dam, when completed, will be a key structure in the program for flood protection in the Kansas river basin. Last summer the region was devastated by overflows causing loss of life and more than a billion dollars' damage.

Congress, after investigations of the flood, last November provided $2 mil-

get a Bantam®!

Why fuss around with special "one-purpose" machines, or costly hand crews, when a *low-cost* BANTAM Back Hoe will handle *all types* of trenching jobs at a big saving in time and labor. Truck-mounted BANTAM drives anywhere, on or off highway, at truck speeds . . . maneuvers in close quarters, steep grades and swampy soils, where bigger machines can't go . . . *digs up to 100' of 5' trench per hr.* Send for complete facts today, including details on BANTAM crane adaptor and fast-change backfill blade (extra) for handling *entire* pipe installation with *same* machine.

SB-H-6

Bantam Hoe digs to 14' depth . . . uses 20", 25" or 30" buckets. Easily converted to dragline, clamshell, crane, shovel, etc. Specially engineered for truck mounting.

Look!

less than

$6100.00

F. O. B. Waverly, Iowa

(less truck and mounting charges)

Includes complete Bantam Back Hoe unit with boom, stick, and bucket. Price subject to change without notice.

MAIL COUPON FOR COMPLETE FACTS!

Schield Bantam Co.

202 Park St. Waverly, Iowa

☐ Send details on BANTAM Hoe, including crane adaptor and backfill blade.

Name_____

Position_____

Company_____

Address_____

City_____ State_____

SB-H-6

SCHIELD BANTAM

Cranes • Excavators

Get more jobs done at less cost

lion in an emergency supplemental appropriation for the construction of Kirwin Dam.

Under the plan of development, Kirwin Dam will be an earth-fill structure 170 feet high and 11,300 feet long, providing storage space for 315,000 acre-feet of water, of which 220,000 acre-feet will be used initially for flood control purposes.

The contract with the Cook Co. provides that the excavation work must begin within 30 days after receipt of notice to proceed, and be completed within 300 days. It is estimated that about 2½ years will be required to complete the dam and reservoir with its embankment of more than 4 million cubic yards.

Focus Attention on Roads in State Capitals

Highway modernization plans are attracting widespread attention in state capitals throughout the nation with current and prospective developments including:

ALABAMA: Preparing to launch $50 million road building program with the aid of a $25 million highway bond issue authorized by voters last year. Program, which the bond issue advocates said would not require increases in highway-user taxes, will include: $34 million for primary rural federal-aid roads; $10 million for connecting roads through municipalities, and $6 million for secondary roads.

GEORGIA: An enabling act authorizing a 70-mile toll superhighway between Cartersville and the Tennessee state line was passed by state legislature this year.

ILLINOIS: Plans to spend record-breaking total of $100 million on highway construction and improvement projects this year. The total figure, however, includes $20 million in anticipated additional revenue from increased truck license fees currently under attack in a case pending before the State Supreme Court. A final decision adverse to the state in the truck fee case would reduce the 1952 highway program by $40 million according to state officials, because $20 million in federal matching funds would be lost.

KANSAS: Plans 2,377 miles of road construction and repairs and the erection of 154 bridges this year, compared with 1951 program of 1,890 miles of roads and 117 bridges.

KENTUCKY: Major construction projects costing $8,501,500 planned this year as the first part of a five-year program to achieve methodical improvement of key state routes and all federal routes.

MAINE: Highway bond issue of $27 million was authorized last year, but no announcement yet as to when start will be made on the use of this revenue. . . . Further studies expected for extension of the Maine Turnpike north of Portland.

MARYLAND: Additional highway revenues will be sought from state legislature next year. Possible sources mentioned include increasing the gasoline tax, higher truck taxes and toll roads. . . . Report on toll road feasibility due in spring. . . . Advisory group estimates an outlay of $450 million over a 15-year period needed to give state an adequate highway system.

MASSACHUSETTS: Bills for an additional $200 million highway bond issue, increased gasoline tax and toll roads currently pending in state legislature.

MICHIGAN: It is estimated that the state will have a record-breaking total of about $45 million available for building new state roads and bridges this year.

MISSISSIPPI: Plans to spend approximately $21 million on highways this year, of which $14 million will be applied to the primary system and $7 million to the state-aid system approved under a 1950 law.

• A "skidding house" at Oakland, Calif., is demolished at the hands of a bulldozer operator. Heavy rainfall softened the footing of the hilltop residence. Most of it began sliding down a 125-ft. slope and jammed against two oak trees, half way down. It appeared destined to plunge the remaining distance onto an apartment building in the valley. Thus the $15,000 home became a hazard, and the job of removing the hazard fell to bulldozer operator, Terry Fisher of Richmond, Calif. He nudged his Caterpillar D8 tractor up the muddy, unstable slope, using the blade to carve a path. After two hours' work he was in position to begin the dangerous wrecking job. Backing off with the 20-ton rig, Fisher rammed the blade against a wall. He kept ramming until the building finally gave way, then pushed the pieces to where they would do no harm.

NEVADA: Plans to spend $8,539,300 on highways this year, an increase of slightly more than $250,000 over last year's state highway budget.

NEW JERSEY: Proposal pending for $300 million bond issue and 1c gasoline tax boost to aid in financing long-range highway modernization program. Additional toll highway and bridge projects costing some $275 million also suggested.

NEW YORK: Governor's budget recommendations for highways, supplemented by federal grants, would permit state to undertake $125 million of new major highway construction during 1952-53 fiscal year. Last year some $75 million was made available for such purposes, of which $31 million was federal money.

These figures do not include expenditures by the New York State Thruway Authority for continuing construction of its New York City-Buffalo toll super-highway project. The authority is an autonomous agency empowered to issue $500 million in revenue bonds, backed by the full credit of the state. Initial sale of these bonds expected about April.

In addition to the contemplated major highway projects in New York

every other MARION 151-M on the IRON RANGE is a REPEAT ORDER

A NOTABLE RECORD OF ACCEPTANCE

Many of the biggest companies on the Iron Range are owners of MARION 151-M shovels.

MORE THAN HALF of these MARION owners have two or more 151-M machines.

In these days of urgent demand for increased ore production —days of high operating costs—days in which it is perhaps more important than ever to make wise selections of equipment, MARION is humbly proud of this unusual record of acceptance.

Ask your nearest MARION representative about the jobs the 151-M is doing in quarrying, coal stripping, construction and mining.

MARION POWER SHOVEL CO.
MARION, OHIO, U. S. A.

OFFICES AND WAREHOUSES IN ALL PRINCIPAL CITIES

from 3/4 cu. yd. to 45 cu. yds.

State, an additional $15 million of state and federal funds will be available for construction and improvement of secondary town and county roads.

OHIO: To expedite financing, the Ohio Turnpike Commission decided to reduce the initial length of its projected toll superhighway from an original 241 miles to 181 miles. Revenue bond issue of some $235 million will be placed on market shortly after settlement of the question of steel availability.

PENNSYLVANIA: State Turnpike Commission has authority for several extensions of its existing toll highway facilities, with first attention expected to be given a projected connecting link with the New Jersey Turnpike.

OKLAHOMA: State highway construction funds expected to be increased by more than $10 million as the result of a 1951 law which provided that any surplus in the state general revenue fund at the end of this fiscal year shall be transferred to the State Highway Department for road building. Highway bond issue approximating $35 million may be sought next year. State turnpike authority expected to borrow at least $7 million more than the original $31 million revenue bond issue for completion of its Oklahoma City-Tulsa toll highway.

OREGON: In announcing plans for the sale of the second $15 million installment of its authorized $40 million road bond issue, the State Highway Commission also disclosed approval of projects that will use more than $6.5 million of the bond funds. An initial $15 million worth of bonds was sold last fall.

UTAH: Plans largest road construction program in the state's history, calling for expenditure of $10,295,000 during 1952. This outlay, which will be in addition to regular maintenance and repair costs, will improve 268 miles of state and federal highways.

VERMONT: A projected $10,326,000 three-year road building program on the Vermont federal and state-aid systems would require increased legislative appropriations, with the issue to confront the 1953 legislature.

VIRGINIA: Governor called for a study of the state's highway modernization problems, including the possibility of toll roads. Automotive Safety Foundation study indicated a minimum of $21.3 million annually during the next 10 years should be spent on 2,700 miles of the state's most heavily traveled highways. Measures introduced in current legislative session included a toll road enabling act.

WEST VIRGINIA: Recently sold $6 million of state road bonds to finance construction of primary highways. State Turnpike Commission awaiting steel allocation to permit it to proceed with issuance of $90 million in revenue bonds to finance an 88-mile toll superhighway from Princeton to Charleston.

WISCONSIN: Plans a $54,963,000 highway construction and improvement program this year, of which $16,975,000 is expected from federal funds and the balance from the state, counties, and local units of government.

Equipment Company's Staff Gets Field Experience

The Rish Equipment Co., with six plants in West Virginia, Virginia, and Ohio, recently tried a new wrinkle in heavy equipment sales training. The company's entire 60-man sales staff, along with top officials and managers, spent four days out in the open operating the large machinery they sell.

The project was carried out on a large vacant piece of land on the outskirts of Richmond, Va. More than $250,000 worth of equipment was assembled for the operation.

The equipment armada included everything from small water pumps and air tools to huge power shovels and a 20-ton International TD-24 bulldozer.

Manufacturers were quick to sense the value of having the salesmen use their equipment under actual working

. . . a *one-man* operation from job to job. Just tilt the trailer bed, drive your equipment aboard and you're off to the next assignment. All this in a matter of minutes.

This rugged Jahn Tilt Trailer will safely and economically transport tractors, rollers, compressors, mixers and many other types of heavy construction equipment . . . a silent partner in your business of conserving man-hours and saving money.

For further information, fill in and mail attached coupon today.

Single Axle Trailers | Tandem Axle Tilt Trailers | Tandem Axle Trailers

PRESSED STEEL CAR COMPANY, INC.
Jahn Trailer Division
6 N. Michigan Ave. Chicago 2, Ill.
Dept. XE

Dear Sir:
Send me literature on Jahn Trailers of the load limit checked, without obligation.

☐ 8 ton tilt ☐ 20 ton semi ☐ 25 ton semi ☐ 30 ton semi

Name_____

Address_____

City_____ State_____

• This abandoned gravel pit at Richmond, Va., was recently used by the Rish Equipment Co., a heavy equipment distributor, for its outdoor training school. Scattered about this 20-acre, ravine-studded property is $250,000 worth of equipment the company moved in for its 80-man sales and managerial staff to practice on under actual operating conditions.

conditions and dispatched their most experienced instructors to help with the project, dubbed "Operation Field Experience." There were 44 factory men present for the four-day instruction course. All six Rish Equipment service managers also were on hand to help and keep the machines running.

The array of ponderous equipment was arranged in eight sections, or classrooms, on the ravine-studded gravel pit with the men divided into eight groups of eight each. Each group spent four hours on the equipment in each section. Thus, every half day a class would "graduate" and move into the next section.

"Operation Field Experience" was a brilliant success in the opinion of the equipment makers and the man who conceived it—H. D. Anderson, vice president and general manager who has a flair for dramatic and unusual sales meetings. Two years ago he chartered two big busses and took his entire staff on a 10-day, 2,300 mile tour of the manufacturing plants that make the equipment they sell in a five state area.

Anderson summed up the results of the outdoor training session, "The men are bound to be better salesmen. They developed a greater respect for skilled operators and they know what the machines are capable of doing. Now they can operate every machine they sell."

The sales task force was transported to and from the training school grounds in special busses, the men being roused out of their downtown hotel at 6:30 each morning so they could be on the job promptly at 8 o'clock. A large tent was erected at the gravel pit where a hot lunch was served each day at noon.

The possibility of someone getting hurt with powerful machinery bustling about and "green horn" operators, was ever present. To guard against that, each group of eight men was in charge of a "sergeant" whose biggest job was to serve as a safety engineer. As a result there was only one serious injury; one of the assistant managers caught his hands in a power winch two hours before the windup of the four-day operation and had to be hospitalized. The entire operation was directed by general service supervisor, James Supler.

Trencher Cuts 3⅛ Miles in Single Day

Is 17,200 feet of 22-in. x 40-in. trench, dug in 9 hours, on a single working day, the world's trench digging record? George W. O'Connor, head of the O'Connor Construction Co. of Fromberg, Mont., claims the championship on the basis of his trencher's performance on Oct. 4, 1951, during the construction of a gas pipe line from the Two-Dot gas wells to Warren, Mont.

Operator of the trencher during its record-making performance was Fagin Rehm of Burley, Ida. O'Connor's Cleveland trencher is powered by an International UD-9 Diesel engine. O'Connor reported his crew had the advantage of ideal soil for the trenching on the bench of Elk Basin where the company was laying 6-in. pipe.

NOT in the *Contract*

Father: "Daughter, that young man who walks you through the park certainly doesn't look very polished."

Daughter: "Well, I'll admit he's a little rough around the hedges."

"Some plants," said the teacher, have the prefix dog. "For instance, there is the dogrose, the dogwood, the dogviolet. Now name another plant prefixed by dog?"

"I can," shouted a little redhead from the back row; "Collie flower."

A friend of ours spent his vacation last summer in a seashore cottage, and he has testified that he never suffered a more miserable time in all his life. His grief came from the couple who lived next door.

"What was the matter with them?" we innocently inquired.

"Matter!" he shouted. "The husband was a golf maniac, while his wife was an auction crank. And as a result, I never got a wink of sleep. All night long, in his dreams, he kept shouting 'Fore!' and all night long in her dreams, she kept responding 'four and a half!' "

The widow had placed a tombstone at her husband's grave, bearing this noble sentiment: "Without you I cannot bear to live." A year later she remarried and ordered the monument maker to add one word. So he went back and chiseled, "alone."

Selectee: "They can't make me fight."

Draft Board: "Maybe not—but they can take you where the fight is and let you use your own judgment."

"Are you the young man who jumped in the river and saved my son from drowning when he fell through the ice?"

"Yes, ma'am."

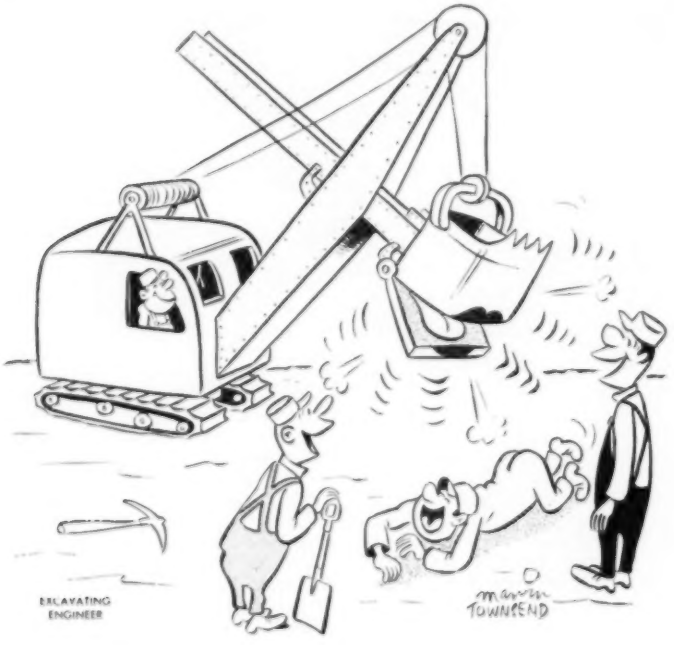
"Well, where's his mittens?"

The daughter of a noted financier threw her arms around the neck of the bridegroom-to-be. "Oh, George," she cried, "Dad's going to give us a check for a wedding present."

"Good! Then we'll have the wedding at noon instead of two o'clock."

"But why, dear?"

"The banks close at three."



"Joe's a scream when he does his mother-in-law imitation."

Sundown found a lonely Indian climbing to the top of a bluff. There he built a fire and began to send smoke signals to his lady friend across the valley. A short while after he had begun an Air Force plane dropped an atomic bomb in the valley between the Indian and his lady fair. "Gosh," said the Indian as he watched the billowing mushroom of smoke, "I wish I'd said that."

A group of tiny tots were overheard discussing their arrival in this big world. The versions differed somewhat. Billy claimed that his folks had bought him in a department store; Tommy said the stork brought him; Diane said the doctor had brought her.

Then a very tiny miss piped up, but rather modestly:

"My folks were too poor to buy me; I was homemade."

Satan to new arrival: "Hey do you think you own this place?"

New arrival: "Yeah, my wife gave it to me while I was on earth."

A well built girl is like a circus. A fellow doesn't know where to look first.

Mistress: "I suspect my husband of stepping out with his secretary."

Maid: "Oh you're just trying to make me jealous."

"I've never heard a man talk so fast in my life."

"Why shouldn't he? His father was a tobacco auctioneer and his mother was a woman."

As he felt his way around the lamp post he said, "Sno use. I'm walled in."

A minister while visiting one of his flock who had been a sailor, heard the parishioner's parrot make a few remarks in the way only a true sailor's parrot can. The man was very much embarrassed and apologized. The minister didn't seem alarmed, but said he had a parrot that prayed all the time. After a while the good reverend made the suggestion that he thought his parrot would have a good influence on the sailor's bird. The sailor agreed, so the next day the minister brought his parrot to spend a few days with the other bird.

When the sailor's parrot saw the addition to his cage he immediately remarked, "How about a little loving, babe?"

Answer: "What the h--- do you think I've been praying for all these years?"

"CAT" DIESEL ENGINES BACK-TO-BACK: a winning pair!

Using two "Caterpillar" Diesel Engines, the Belle Glade Rock Co. of South Bay, Fla., collects a payoff of 100 yards of aggregate fill an hour.

A "Cat" D318 Diesel Engine powers its Northwest ¾-yard dragline which loads lime rock into a Cedarapids Crusher driven by a "Caterpillar" D315 Diesel Engine. The fill is used for streets, roads and construction.

Operating "Caterpillar" Diesel Engines as a team is bedrock common sense. When you standardize on these dependable power plants, you get standardized products. Many of their parts are interchangeable—saving you a lot of wasted motion and expensive down-time.

Then, too, with "Caterpillar" equipment you get the benefit of swift, reliable service. Your "Caterpillar" Dealer knows your equipment and problems.

"Cat" Diesel Engines are built for long, productive hours of work. You can stretch their money-making life with a few minutes of good preventive maintenance each day. Nobody loses when minutes of maintenance become hours of production.

CATERPILLAR TRACTOR CO. • PEORIA, ILLINOIS

CATERPILLAR

REG. U. S. PAT. OFF.

DIESEL ENGINES
TRACTORS • MOTOR GRADERS
EARTHMOVING EQUIPMENT

Equipment

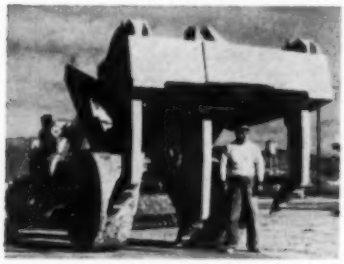
You Ought to Know About

Ripper

Manufacturer: Peterson Tractor & Equipment Co., San Leandro, Calif.

Claims: A 15-ton, heavy duty ripper, capable of penetrating 60 inches in extremely tough material, is now in production.

This ripper will take the combined drawbar pull of six of the largest tractors now on the market or 180,000 lbs. on the center tooth alone. The makers



claim it will rip any laminated or foliated material, such as shale, decomposed granite, etc. The center is designed for three depths of penetration—60, 48, and 36 inches; the outside teeth for two depths—48 and 36 inches. The ripper has a wide range of application and in many cases will take the place of explosives for shattering material to be handled by scrapers or shovels.

Specifications for the ripper are: weight—30,000 lbs., overall width—9 ft. 0 in., overall length—25 ft. 6 in., height (loaded for shipping)—9 ft. 9 in., width of wheels—18 inches, diameter—52 inches, rooter shank—5 x 15 in., depth of penetration center tooth—60 in., 48 in., 36 in., depth of penetration outside teeth—48 in., 36 in., controls—rear cable, and cable, 9/16 in., 210 ft. long.

Electrodes and Welding Rods

Manufacturer: Metal & Thermit Corp., New York 17, N. Y.

Claims: A new line of hard-facing electrodes and acetylene welding rods is in step with an increasing interest in hard-facing.

Hard-facing will become more and more important as basic materials become tighter in supply. The new electrodes, recently added to the Murex line, include rods for extreme abrasion, medium and heavy impact, severe shock, high red hardness, and extreme heat and corrosion resistance. In addition, there is a new Murex tungsten-carbide rod which provides a good slag-free deposit, allowing all residue to be readily cleaned away by wire brushing. These new electrodes are fully field-tested and already in use on a wide variety of hard-facing applications. Descriptive literature may be obtained by writing to the company at 100 E. 42nd St., New York 17, N. Y.

Jet-Piercing Development

Manufacturer: Linde Air Products Co., Division of Union Carbide and Carbon Corp., New York 17, N. Y.

Claims: Secondary blast holes are now being pierced at a rapid rate in some quartzite and sandstone quarries, using multiple hand-operated jet-piercing units supplied with oxygen, fuel and water from a compact mobile car-

rier. A unit of this type, operating in a Canadian quarry, enabled four jet-piercing blowpipes to pierce blast holes for two hours without shutdown. The mobile supply carrier was constructed by the quarry from specifications supplied by Linde and modified by the quarry operators for their particular use.

Employment of the new self-contained unit, which allows up to four operators to pierce approximately 450 feet of blast hole without shutdown, accelerates rock removal operations. Normally, only two blowpipes are in operation at one time. Large boulders or ledges, which sometimes remain after primary blasting to hamper loading operations, can, in the case of certain hard rock, be prepared for reduction far more rapidly with these new units than by any other means.

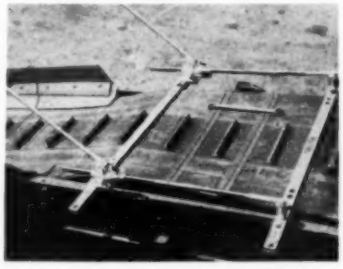
The mobile gas and fluid supply carrier consists of a standard truck chassis fitted out with four banks of large standard-capacity oxygen cylinders, a steel holding tank for fuel oil, and a gasoline-driven air compressor and tank for pressurizing the fuel oil tank. Cooling water for the blowpipes is supplied to the unit from a hose extension to the quarry supply line. Feeder lines from the oxygen cylinder manifolds and the oil and water tanks terminate in four sets of take-off stations on the control panel at the rear of the truck. One or as many as four hand jet-piercing blowpipes can be connected to the take-off panel by high-pressure rubber hoses whose lengths depend on the extent of the particular quarrying operation.

The jet-piercing process has been applied successfully in United States and Canadian quarries within the last several years as an advanced method of "drilling" holes into which blasting explosives are loaded for breaking up rock or ore formations. Essentially a process using the exhaust from a small rocket-type motor as the "drill," jet-piercing has been employed to pierce primary blast holes as deep as 31 feet, and as large as 7½ inches in diameter which can be expanded to considerably larger size where required.

Belt Stretcher

Manufacturer: G. N. Crawford Equipment Co., Pittsburgh 8, Pa.

Claims: For those who have the irking problem of repairing or changing a conveyor belt, the Farnco "All Aluminum" Conveyor Co. has developed a tool to put the belt back together



with all the rigid tautness in a fraction of the time usually spent, and with the least amount of effort.

With the new Far-Pul stretcher, the process of changing or repairing a belt is now made a simple task, and, can easily be handled by one man. The ends, which are firmly gripped between two bolted plates, are connected with two jacks on an adjustable bar; one on each side of the belt. The process of bringing the loose ends together requires only the minimum pumping of the jacks, and each jack controls its side of the belt, permitting an accurate mesh of the stitched belt.

The tool is made in varied sizes to fit belt widths from 8 to 36 inches.

Far-Pul is distributed nationally by the G. N. Crawford Equipment Co.

Propane-Butane Trucks

Manufacturer: International Harvester Co., Chicago 1, Ill.

Claims: The motor truck division of International Harvester Co. has introduced, for the first time in motor truck history, factory-built liquefied-petroleum-gas-powered engines as Underwriters Laboratories listed equipment on trucks.

The new LP-gas (propane-butane) engines are optional on all truck models equipped with the company's heavy-duty Super Red Diamond engines. The new LP-gas-powered models include the LP-185, LP-195, and LP-205 Roadliners, and all other models in the L-185 through LF-210 series.

The potential production of LP-gas is large, with costs in most states running several cents per gallon under that of gasoline. The fuel is available at approximately 4,000 bulk distributing plants in the United States. Large fuel tanks permit trucks to run as far as 400 miles between refuelings.

Operators will also find that the life of motor oil is considerably lengthened. The use of LP-gas eliminates the washdown of lubricating film and oil dilution. With these elements of deterioration eliminated, a cleaner engine will result, and a reduction in maintenance costs is experienced.

The high-octane qualities of LP-gas make use of higher compression ratios possible on the three LP-gas adapted Super Red Diamond engines. The three engines are the "372," the "406," and the "450."

By incorporating especially engineered LPG carburetion, cold manifolding, and other refinements in the production designs, advantage can be taken of the combustion qualities of LP-gas which forms no carbon sludge or gummy deposits. Because of the dry gas characteristics of propane-butane fuel, the elimination of these foreign properties is effected in these LP-gas engines.

Manifolding arrangement is new because successful engine operation in this system depends upon a cold induction system free from the hot spots necessary for gasoline engines. This was effected by completely divorcing the intake and exhaust manifolds, eliminating the connection between the manifolds as it exists in the standard engine.

The standard gasoline tanks have been replaced, on the LP-gas models, by heavy-steel, dual, 62-gal. liquid measure tanks. They are filled to approximately 90% capacity, depending upon temperatures, allowing space above the liquid for expansion. These heavy, specially constructed tanks are designed to store the fuel supply under

¾ cu. yd. Sauerman Slackline Cableway pictured at right has solved permanently the problem of cleaning out two settling ponds at a coal washery. About 5,000 tons of slurry must be removed two or three times a year. A mast is set up for the cableway at the edge of each pond. When the cableway finishes its job at one pond, the guide blocks and cables are moved over to the other mast. The cableway hoist remains at a fixed location between the ponds.

SAUERMAN method . . .

Sauerman Slackline Cableway

Sauerman Scraper Excavator

Sauerman Scraper Stockpiler

Simplifies Material Handling!

Wherever there are problems of long range digging or stockpiling, Sauerman scrapers and Cableways constantly prove their ability to move large yardages at low cost.

A Sauerman machine reaches across a river, bog or pond, down into a pit, up to the top of a hill or across a wide stockpile — moves material from any point within its radius, and dumps automatically wherever required. One-man control, fast action. Maintenance is easy; a few expendable parts take all the wear.

Whether your project is large or small, there is a size and type of Sauerman machine suited to your requirements — a machine that will give you years of steady service at minimum expense, no matter how tough the work it has to do.

Write us about your interests and we will send illustrated catalog by return mail.

Rope Haulage Equipment Specialists Since 1909

SAUERMAN BROS., Inc.

574 S. CLINTON ST. CHICAGO 7, ILLINOIS

all operating conditions. The tanks are refilled at service stations by pumping the fuel in liquid form through a hose fitting which is attached to the fill valve on the pressure tank. Safety features include vertical venting pipes extending above the cab to permit discharge of relieved gas into the atmosphere; seal caps and automatic excess flow shut-off valves on fuel tanks and in the lines; electric shut-off valve; and extreme high-pressure lines and fittings.

Quarry and Mining Shovel

Manufacturer: Bucyrus-Erie Co., South Milwaukee, Wis.

Claims: This new 6-yd. Ward-Leonard electric excavator is known as the Model 150-B. For the first time, field-proven and exclusive features of the company's large stripping shovels and draglines have been incorporated in an excavator of this size.

The shovel has a lower boom section rigidly connected to the A-frame. It is an integral part of the machine. Widespread boom feet eliminate sway braces. The upper boom section is pin-connected to the lower boom section and is suspended from the A-frame by fixed length bridge strands. The dipper handle is tubular and free to rotate in a cylindrical saddle block which contains rubber cushions to absorb shock loads during plugging of the swing. Single-part doubled hoist ropes are attached with an equalizing sheave to each side of the dipper. The conventional dipper bail is not used.

Crowd and retract are accomplished by twin ropes, and the crowd machinery is located at the forward end of the revolving frame instead of on the boom. This reduces swing inertia as compared to older designs. The tubular handle, free to rotate, and the rope crowd and retract contribute to low front-end maintenance. The dual twin hoist, an exclusive Bucyrus-Erie feature, automatically applies hoisting effort where needed on the dipper lip and teeth to cut through local obstructions in the bank. The dipper moves upward steadily in its digging stroke rather than detouring obstructions. The relatively light weight of the tubular handle and a favorable relationship between hoist and crowding power give a maximum of available digging effort to the shovel dipper.

The shovel is fully convertible to a dragline, with the drag and hoist functions operated by independent electric motors. The difficulties of field conversion have been reduced to a minimum, and the machine as a dragline has the notable speed and power associated with the independent-motor draglines of larger sizes which have been in

highly successful operation for many years.

The caterpillar mountings are notable for sturdy construction and low-cost maintenance. The treads are of box-section design for hard service. Idler rollers are large in diameter, few in number, and have their bearings located well above mud and dirt under ordinary conditions. Efficient seals are provided to eliminate entrance of abrasive material into the bearings. Rapid change is provided between hoist and propel to facilitate quick move-ups and prompt travel away from dangerous faces if required.

The model 150-B quarry and mining machine is constructed of quality materials, including castings made in the company's foundries.

Diesel Engine

Manufacturer: Nordberg Mfg. Co., Milwaukee, Wis.

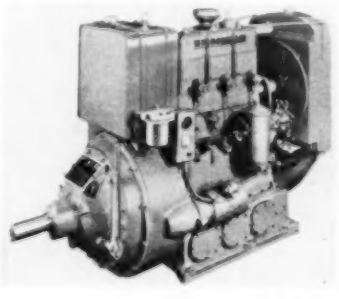
Claims: Addition of a new, three cylinder Diesel engine, conservatively rated at 30 to 45 hp within a speed range of 1,200 to 1,800 rpm, supplements the Nordberg 4FS one and two cylinder, 10 to 30 hp Diesel engines.

This new engine, known as the 4FS3, has a 4½ inch bore and a 5¼ inch stroke and is a four-cycle, vertical, mechanical injection Diesel engine. Built as a complete, self-contained, ready to operate unit, it is available as an electric generator set, pumping unit and with clutch or stub shaft power take-off for direct connection or belt drive.

The Nordberg 4FS3 generator set is completely equipped and is delivered ready to connect to load. It is available in direct or alternating current models from 20-30 kw in all standard voltages, 50 or 60 cycle. This unit is built to economically generate light and power for large magnets, sand and gravel plants, saw mills, oil field rigs and other auxiliary equipment.

Built with side suction, two ball bearing pumps, with statically and dynamically balanced impellers, the 4FS3 pumping unit has a capacity of 500 to 3,000 gpm at 20 to 220 feet head. Its compact design and operation makes it particularly applicable for washing, draining, dredging and general pumping service in the contracting and quarry industries.

Nordberg 4FS3 Diesel engines with direct or clutch power drives are readi-



ly adaptable for replacement engines in hoists, small shovels, etc., and can also be used as a power unit for driving well drilling machines, compressors, blowers, saw mills and oil field pumps.

The engine is designed to start and operate on regular Diesel fuels. Electric starting equipment includes a starting motor and a "V" belt driven battery charging generator which is provided with voltage regulator and reverse current protection. The engine can also be supplied with manual starting only, if desired. A simple compression release is provided to facilitate hand cranking.

The 4FS3 is built for stationary applications with a radiator type cooling system which provides efficient cooling of the combustion chamber, fuel injection nozzles, valves and exhaust passages. Cooling water temperature is automatically controlled by a thermostat and recirculating connection installed on the outlet manifold.

A diaphragm type fuel oil transfer pump with hand priming lever, is actuated by the camshaft. All fuel is strained and filtered three times before passing to the fuel injection pumps which deliver the fuel to the injection nozzles at high pressure through heavy steel tubing. A mechanical flyball type governor, gear driven from the camshaft, regulates fuel delivered to the nozzles in accordance with the load on the engine.

Electrical Tape

Manufacturer: Minnesota Mining and Manufacturing Co., St. Paul 6, Minn.

Claims: A new oil-resistant tape for rapid insulation build-up on splices in large power cables is designated "Scotch" brand electrical tape No. 25. It is made of synthetic rubber providing greater dielectric strength and resistance to high temperatures than natural rubber tapes.

The chemical-resistant qualities of the tape make it especially suitable for use in oil drilling, mining, and underground cable operations, while the 40-mil thickness and extreme stretch (1,500% breaking point) make possible smooth insulation wraps on irregular surfaces.

Dielectric strength is 15,000 volts unstretched, and 10,000 volts at 500% elongation. It has an electrolytic corrosion factor of 1.0 and an insulation resistance of 100,000 megohms.

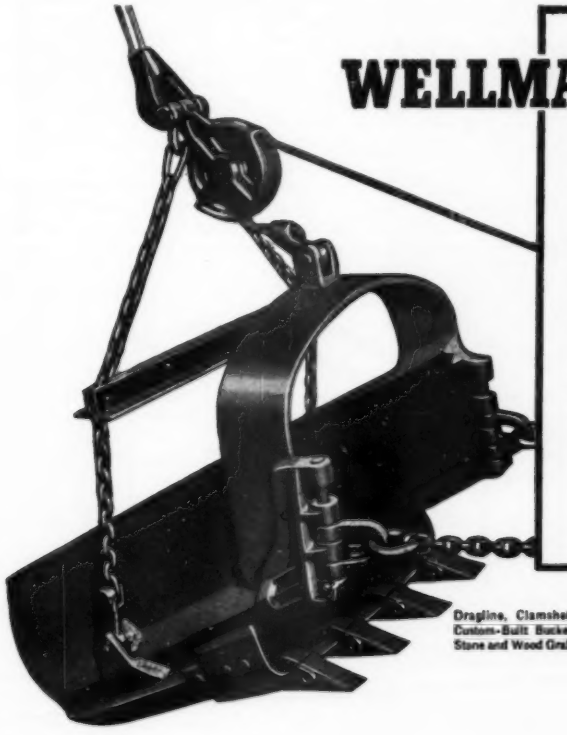
The tape is available in ¾-in. x 15-ft. rolls, is green-colored, and has a white strippable liner to be removed before use.

Since it fuses to itself, forming a solid homogeneous mass, it requires no adhesive. The tape is not designed as a sole insulation. "Scotch" plastic electrical tape No. 33 is recommended as the outer wrap for protection against moisture, weather, and abrasion.

Submersible Pump

Manufacturer: Lancaster Pump and Manufacturing Co., Inc., Lancaster, Pa.

Claims: The submersible Drain-Pak is a small ⅓ hp sump and all-purpose



WELLMAN *Williams Type*

MORE YARDAGE PER DAY

● Elimination of excess materials and careful weight distribution permit rapid, rhythmic operation of Wellman Dragline Buckets. Operators can cover a wider digging radius with this streamlined bucket.

Built of special alloy steel, using strong welded design, Wellman buckets provide strength and stamina for long-term economy. Perforated designs also available. You'll do better with Wellman.

Want Facts? Write for free descriptive bulletins

THE WELLMAN ENGINEERING COMPANY
7000 Central Avenue
Cleveland 4, Ohio

pump. It is an all bronze pump with stainless steel motor housing.

One of its engineering advantages is floatless construction. With no float . . . no diaphragm . . . and no electrodes to fail or require adjustment, the Drain-Pak is a greatly simplified unit. Simplicity is further increased and maintenance reduced because no lubrication is required.

Weighing only 31 lbs., the pump is easily carried by one man. It can be lowered to depths up to 15 ft. The maximum capacity is 3,300 gph.

Tests prove that the Drain-Pak not only provides good performance for emptying sumps, but also when used as a general utility unit to pump out flooded cellars, ditches, pits, elevator shafts, construction excavations, and all hard-to-get-at places.

Engine Series

Manufacturer: Ford Motor Co., Dearborn, Mich.

Claims: Three new heavy-duty engines equipped with overhead valves, bring to six the number of Ford engines especially built for industrial applications.

Also available, is a new Ford Multa-Torque converter. It offers all the advantages of a fluid coupling plus torque multiplication, and is designed to absorb shock overloads, prevent stalling under excess loads, and start bigger loads faster.

The new engines are the "317," "279," and "215." The numbers identifying each engine correspond to its displacement in cubic inches.

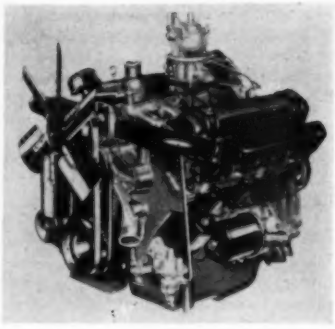
The "317" is rated at 140 brake hp at 2,800 rpm. It is a V-8 with 3.8-in. bore and 3.5-in. stroke.

The "279" is rated at 125 brake hp at 2,800 rpm. It also is a V-8 and has a 3.56-in. bore and 3.5-in. stroke.

The "215" is a 6-cylinder engine rated at 93 brake hp at 2,800 rpm. It has a 3.56-in. bore and a 3.6-in. stroke.

These high compression low-friction overhead valve engines deliver more horsepower per cubic inch displacement. The short-stroke design reduces piston travel and improves fuel economy. Cylinders are cast in bloc of special high-grade iron. Free-turn valves are of high chrome nickel alloy.

All engines have heavy-duty replaceable thin shell precision copper-leaded bearings. The oil system has a full-flow filter with renewable element that cleans all engine oil and reduces ring wear. The full-length water jackets



completely surround each cylinder, simplify cooling and provide better temperature control.

Making up the rest of the Ford family of industrial engines are the 4-cylinder "L" head "120," the 6-cylinder "L" head "254," and the V-8 "L" head "239." The Ford Multa-Torque Converter is for use with the "215," "239," and the "254" engines.

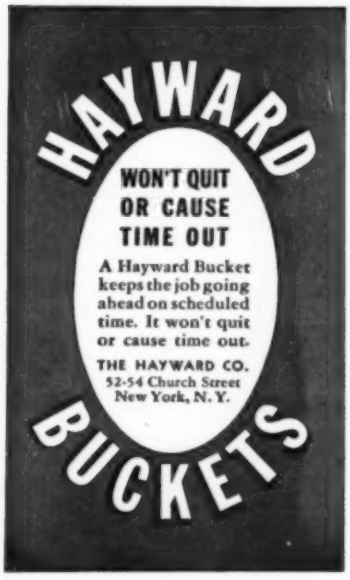
Circuit Extensions

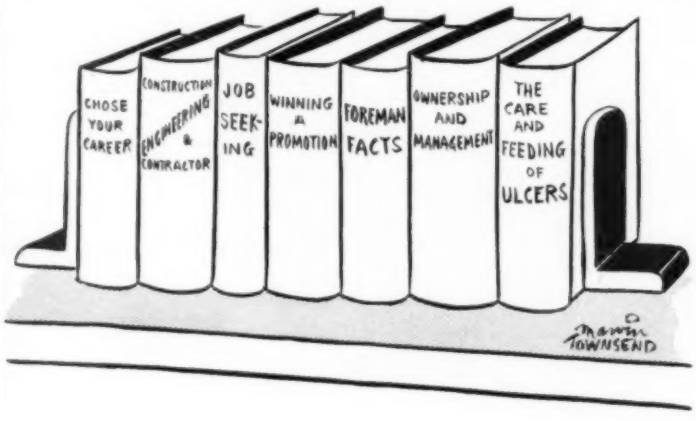
Manufacturer: National Electric Products Corp., Pittsburgh 19, Pa.

Claims: A series of fully approved portable branch circuit extensions that literally roll power, light, or heat to any location on construction jobs, or in underground construction and repairs have just been announced. Known as the NE Rolla-Duct series, the devices, which are collapsible, are so portable that they may be carried on public utility service trucks. The series includes a power and light unit, a strip of flood lighting and a strip of infra-red heating units.

Engineered for electrical safety, the strips are grounded and provided with a circuit breaker incorporated in the strip for worker protection.

The portable assembly consists of a 3 foot 10 inch strip of No. 1700 Sur-


HAYWARD
WON'T QUIT
OR CAUSE
TIME OUT
A Hayward Bucket keeps the job going ahead on scheduled time. It won't quit or cause time out.
THE HAYWARD CO.
52-54 Church Street
New York, N. Y.
BUCKETS



faceduct, also a National Electric product. This is swivel-mounted on an all-steel tubular carriage. The unit's wheels are made of special materials that are non-conductive, and which resists chemicals, moisture, and oil.

The carriage-mounted duct is carried on a ball-and-socket swivel that locks into any horizontal or vertical position. It may be elevated to a height of 5½ feet, or the carriage may be collapsed to roll under jobs. Thus

it can furnish light and power right at the point desired by a worker. The portable assembly is provided with a 21-foot power line of three-conductor, heavy duty cable. The neoprene jacketing, which is rugged and resists chemicals, acids and physical abuse is safe to use in wet or damp places.

Providing portability of power and light with safety, the carriage mounted units carry an approved rating for 20 ampere loads for 115 or 220 volt operations. One of the units carries eight outlets plus two flood-light sockets, and thus is said to be ideal for all portable power tool use. The usable service area of permanent electric outlets is increased to a radius of 20 feet, or further.

Torque Converter

Manufacturer: The Torcon Corp., Ashtabula, O.

Claims: The new Model 17-K single-stage, three-element type unit has been added to the standard line of Torcon torque converters. Combining a hydraulic torque converter and hydraulic coupling in a single unit, it provides superior automatic transmission for shovels and cranes, oil well rigs and service equipment, logging machinery, road machinery, material handling devices such as lift trucks and front end loaders, etc. This model can be used with gas or Diesel engines rated up to 300 hp and is roller-bearing equipped to assure maximum life in heavy industrial service.

The converter has a variable torque ratio up to 3:1. At zero output speed, the torque multiplication is highest and this gradually decreases with increasing output speed until a point is reached where the output and input torque are equal. Because the engine performs at a practically constant speed during the converter range, overload will not cause stalling. When the torque ratio reaches 1:1, the reaction member is free wheeled and the unit acts as a hydraulic coupling. In the coupling range, output speed increases in nearly direct proportion to engine speed.

Major elements of the unit consist of the converter pump, converter turbine and reaction member. For continuous operating efficiency and simplicity of servicing, there are no close clearances

HERE'S HOW IT WORKS:

POSITIVE —AUTOMATIC

YOU DON'T HAVE TO

KICK THE BUCKET

TO CLEAR IT—IF IT'S A

PEKAY

M-T-MATIC

Irresistible leverage sweeps out SAND —COAL—GRAVEL, or any granular materials, on every trip—*even if frozen or close-packed.* The secret is the separately mounted stripper-plate—which *must* push up and out when it starts over pulley radius. THOUSANDS NOW IN USE —handling *more* material at same or faster belt speeds. Saves belts—cuts maintenance—easy to install on any elevator conveyor—all sizes.

QUICK DELIVERY!

standard buckets also available . .

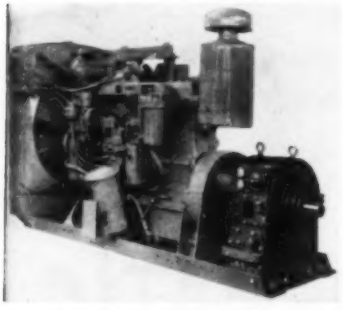
★ SEND FOR PRICES TODAY (give present bucket size)

PEKAY MACHINE & ENGINEERING CO.

100 N. LA SALLE STREET CHICAGO 2, ILLINOIS

in these elements—which are each single-piece aluminum castings. Piston-ring type oil seals, which contain the oil in the working elements, permit passage of a small amount of oil to provide continuous controlled bearing lubrication. This controlled leakage drains into the oil reservoir which is integral with the converter housing. The bearings are designed so that sprocket or gear drive can be attached to the output shaft without the necessity of an outboard bearing.

This unit is constructed for ease of installation and service. The chain-driven oil circulating pump is mounted



on a base plate for accessibility and ease of inspection. The converter uses standard SAE No. 10 motor oil and incorporates built-in oil filter, temperature and pressure gauges. It can be modified to meet the specific requirements of individual applications.

Dump Truck

Manufacturer: White Motor Co., Cleveland 1, O.

Claims: A new model Sterling-White 18-ton dump truck for stripping and quarry operation features a planetary-drive type rear axle equipped with the Super-Traction differential.

This differential divides the power delivered to each rear wheel according to the grip dictated by road and load condition. When traction is poor under conditions such as wet, muddy and slippery roads and runways, the greater portion of the pulling power is transferred to the wheel having the best grip. This eliminates almost entirely the spinning of either wheel and permits operating under conditions that would otherwise stall the vehicle.

Also incorporated in the Planetary-Drive rear axle is the "Tri-Pinion Drive." This gear arrangement, with the internal ring gear rotating around the sun gear and the idler or intermediate gears rotating on fixed centers, permits using larger and huskier gears within the available space. In addition the power is applied at a greater radius from the wheel center.

For exceptional flexibility and ease

in maneuvering into position under shovel or up to the breaker or coal cars, this unit has a short 161 in. wheelbase and a hydraulic power-actuated steering gear. The most efficient speed for every operating condition can be selected quickly from a range of 10 forward speeds in the heavy-duty transmission. Tires are 13.00-24 front and 14.00-24 dual rear. Both front and rear tires having a tough lug type tread especially designed for operating on rough, unimproved surfaces such as those generally encountered in off-the-road service.

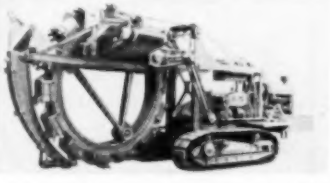
Long frame life and ease of maintenance are provided by the woodlined frame and bolted construction. The white oak wood insert, which lines the entire length of the frame, absorbs road shocks and provides a 2-in. bearing surface for the bolts, used instead of rivets. This bolted construction simplifies maintenance.

Trenching Machine

Manufacturer: Parsons Co., Newton, Ia.

Claims: With field tests completed, full scale production has started on two new models of Trenchliners. Both are full crawler-mounted, wheel-type machines. Model 202 is designed primarily for drainage and utility trenching. Model 215 is a special pipeline Trenchliner.

With a choice of either 52 hp gasoline or 55 hp Diesel engine, the Model 202 is equipped to dig in 30 separate feeds from 6.2 inches to 18.5 fpm; and in 9 widths from 13 to 31 inches wide and up to 6 feet deep. Other features include: friction clutch control of digging wheel, easily changed bucket-



fronts with cutting lips or "Tap-In" teeth, shiftable and reversible belt conveyor for discharging spoil on either side of machine.

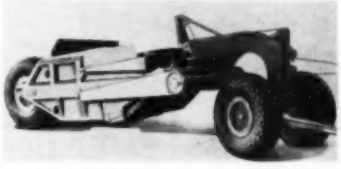
Crawler mounted, with either 16 or 20 inch treads, the Model 202 has only 5 to 6 psi ground bearing pressure. This is particularly important on drainage, irrigation, municipal and utility-type projects for which the machine is particularly designed. For laying drainage tile, a special box and chute are available as optional equipment.

Companion Model 215 has several outstanding features designed for "mile-a-day" production on cross-country pipeline installations: 6 digging wheel speeds up to 11.2 rpm, standard-make tractor type crawlers with lug-type shoes, 18 inch treads, and choice of two standard-make 55 hp Diesel engines.

Scraper

Manufacturer: Caterpillar Tractor Co., Peoria 8, Ill.

Claims: With over 40% more struck capacity than previous models, the new No. 90 scraper is designed to increase earthmoving production when



used with D8 tractor power. Struck capacity of 21.2 yards can be increased to 25.5 yards with the addition of top extensions or sideboards. Likewise, heaped capacity is 27 yards or 31 yards with the available sideboards.

This scraper moves dirt with the aid of a hard surfaced, reversible cutting edge. Material is carried in a flat, double-bottom bowl of high tensile steel. Operation is by means of a cable control unit, which can be mounted on the rear of the tractor.

Tapered roller bearings are installed at each axle. Shipping weight of the unit is 35,100 lbs.

"They give that guy a little raise and right away he's bucking for chairman of the board."

HYDROHOE Cuts Trenching Move-Up Time by 40%

With the smooth extend-retract action of its telescoping boom, the fully hydraulic Bucyrus-Erie Hydrohoe cuts move-up time on trenching as much as 40 percent. Operator begins cut with boom extended to full "out" position. As he trenches he retracts boom, digging right up to the back of truck. This dragshovel earns extra dollars digging, while conventional units are moving up.

After digging a length of trench, operator can peel off the last few inches at grade level — smooth out the scallops, by merely telescoping boom. In addition, ability to retract boom makes the Hydrohoe extra compact for work in close quarters.

These are only a few of the many Hydrohoe advantages. For complete details write us or see your Bucyrus-Erie Hydrocrane distributor. He will be happy to arrange a demonstration. 132H51C

• The new Bucyrus-Erie Hydrohoe gives you not one, but two digging actions: 1. Conventional dragshovel digging arc. 2. A separate horizontal action by means of telescoping the boom.

• By actual measurement this Hydrohoe, digging at an approximate depth of 4 ft., cuts an 11-ft. long trench — without a single move-up.

BUCYRUS ERIE HYDROCRANE

• From Hydrohoe to Hydrocrane—right in the field — only three hours. This quick convertibility increases the on-the-spot value of the Hydrocrane's many attachments—hydraulically operated clamshell bucket, ¾-yd. materials handling bucket, 1-yd. snow and trash bucket, catch basin bucket, grapple, magnet and cranehook.

BUCYRUS-ERIE HYDROCRANE DIVISION
South Milwaukee, Wisconsin

New trade literature

Subject: **Long Hole Drilling**
Content: Recommended procedure for drilling long holes varying in depth from 20 to 150 feet with tungsten carbide Rok-Bits, long hole drilling tools and the standard percussion type drills, is fully covered in a four page bulletin. Such holes can be drilled in any type rock or ore in any direction, in two standard dimensions 1⅞ and 3 inches.
Where to get: Rock Bit Sales and Service Co., 2514 E. Cumberland St., Philadelphia 25, Pa.

Subject: **Tractor Tools**
Content: A 2-color catalog featuring tractor tools for use with Caterpillar-built tractors and equipment has just been issued. The 6-page pictorial and verbal description includes the complete line of Hyster tractor tools and graphically shows practical applications of the equipment to multiply tractor uses and increase tractor production. Included in the literature is the Hystaway excavator-crane; the tractor yarder, winches and donkeys; logging arches and sulkys; and the grid roller for road construction and salvaging bituminous pavement.
Where to get: Hyster Co., Portland 8, Ore. (Cat. No. 1191)

Subject: **Studies in Night Visibility**
Content: Bulletin 43 contains four papers presented at the thirtieth annual meeting of the Highway Research Board. The first, "Factors Affecting the Perception of Relative Motion and Distance Between Vehicles at Night" by Donald R. Hoppe and A. R. Lauer, reports results of a study relating to driver reaction to various conditions of visibility and to perceptual value of a vehicle being overtaken on the road at night. Visibility of the rear end of lead vehicle was varied by mounting thereon reflective panels of different sizes and intensities. In one experiment using a device to simulate roadway conditions, headlight beams of the following vehicle and also of an opposing vehicle were varied. It was found that the relative speeds between vehicles could be discriminated with less difficulty and more quickly if the tailgate of the lead vehicle had highly reflective characteristics. Where panels of high intensities were used it was also found that the size of the tailgate surface could be decreased without causing an increase in time and difficulty to perceive the speed difference. The second paper, by J. E. Uhlaner and Irving A Woods is "A Study of the Relationship between Photopic and Scotopic Visual Acuity." Selected charts for the measurement of visual acuity by day (photopic) were administered to 202 soldiers. These men were also tested with the Army Night-Vision Tester R2X for their scotopic acuity. A positive correlation was found between the measures of these two types of visual acuity. "Field and Laboratory Evaluation of Roadside Sign Surfacing Materials" by James H. Havens and Allie C. Peed contains a discussion of the physical and optical characteristics of sign materials and the results of laboratory and field tests on these materials. In addition to using ordinary sealed-beam headlamps, field observations were made using polarized headlamps and viewers. The relationships between the field and laboratory data are correlated by means of curves in which sign reflectances are plotted against the average effective viewing distances. For reflectance values up to about 0.20 there is a marked increase in viewing distances. The fourth paper is a "Filter Study of the Effect of Certain Transmission Filters on Visual Acuity With and Without Glare" by A. R. Lauer. A representative set of 20 filters was tested for the effect on visual acuity. In all cases there was a decrease in visual acuity with the introduction of a filter.
Where to get: Highway Research Board, National Research Council, 2101 Constitution Ave., Washington 25, D. C. (90c)

Subject: **Wire Rope Assemblies**
Content: Called, "Macwhyte Safe-Lock Industrial Standards Wire Rope Assemblies," this new catalog illustrates and gives detailed specifications for wire rope with fittings permanently attached. Assemblies are used, for operating controls, as a part of machinery and equipment, and for slings and hoists. They are widely used on small gasoline powered equipment, mining machines, automotive equipment, production machinery, laboratory equipment, etc.
Where to get: Macwhyte Co., Kenosha, Wis. (Industrial Standards No. 5201)

Subject: **Backfiller — Tamper — Side Crane**
Content: A four page, two color 8½ x 11 bulletin describes the Cleveland Model 80 backfiller—tamper—side crane. Re-introduced to the con-

struction and utility fields at the request of pre-war users, this one-man-operated machine backfills as it tamps and travels. The folder uses text as well as action photographs to describe operations performed by the 80. Complete specifications and dimension data are presented.

Where to get: Cleveland Trencher Co., 20100 St. Clair Ave., Cleveland 17, O. (Form S120)

Subject: **Arc-Welding Accessories**

Content: Three new two-color bulletins on arc-welding accessories have been announced as available. The three illustrated bulletins describe recommended protective clothing (GEC-867), helmets and glass (GEC-865), brushes, carriers, chipping hammers, paint and weld-spatter compounds and weld gauges (GEC-866). In addition to illustrating and describing the equipment, the bulletins list specifications, type, and catalog numbers for each item.

Where to get: General Electric Co., Schenectady 5, N. Y.

Subject: **Paving Forms**

Content: A description of the new Blaw-Knox heavy-duty self-aligning paving form, which was developed especially for airport paving, is included in a new 12-page bulletin. Bulletin 2370 explains the need for steel paving forms in sizes above 12-in. and in any height specified to meet the present-day airport paving requirements of thicker pavement slabs necessary to withstand the concentrated wheel loads of heavy bombers and cargo planes. The self-aligning features of the paving forms are described, with diagrams showing their advantages in permitting rapid form setting, true to line and grade, regardless of whether the steel stakes are bent or forced off plumb when driven into hard or stony subgrade. The bulletin contains detailed construction features, including the quick-operating lock-joint slide plates for connecting the forms. Complete specifications on forms from 8-in. x 8-in. to 12-in. x 12-in. are given, with additional engineering and suggested purchasing specifications.

Where to get: Blaw-Knox Division of Blaw-Knox Co., Farmers Bank Bldg., Pittsburgh 22, Pa.

Subject: **Snow Removal**

Content: "Open roads protect lives, property and commerce," states the folder — with pictures to illustrate each aspect of protection. The publication shows how, with a few attachments, a motor grader becomes a large-capacity snow removal unit. These attachments include V-type and one-way snow plows, along with special bulldozers and snow wings. One point made is that a motor grader for snow clearing is available during the rest of the year for such jobs as road building and maintaining.

Where to get: Caterpillar Tractor Co., Peoria 8, Ill. (Form No. 30292)

Subject: **Rustproof Chemical**

Content: Rustshield 2, a chemical treatment that produces an oil-retaining, rustproof surface for moving metal parts, is described in a new 4-page publication. Printed in two colors, the booklet discusses application methods and advantages of using Rustshield 2 on sliding and bearing surfaces. A variety of precision parts and defense components are given the treatment to meet U. S. military specifications. This treatment is applied for rapid break-in of moving parts without scoring, scuffing, galling and seizing, and for effective reduction of wear. The coatings are particularly useful when high pressures and high rubbing velocities are involved—as in sliding clutch gears, idler pinions, differential spiders, differential side gears and side pinions. While Rustshield 2 is primarily used for oil retention, wear resistance, and other properties already discussed, it also produces an excellent base for organic films.

Where to get: Octagon Process, Inc., 15 Bank St., Staten Island 1, N. Y.

DREDGES

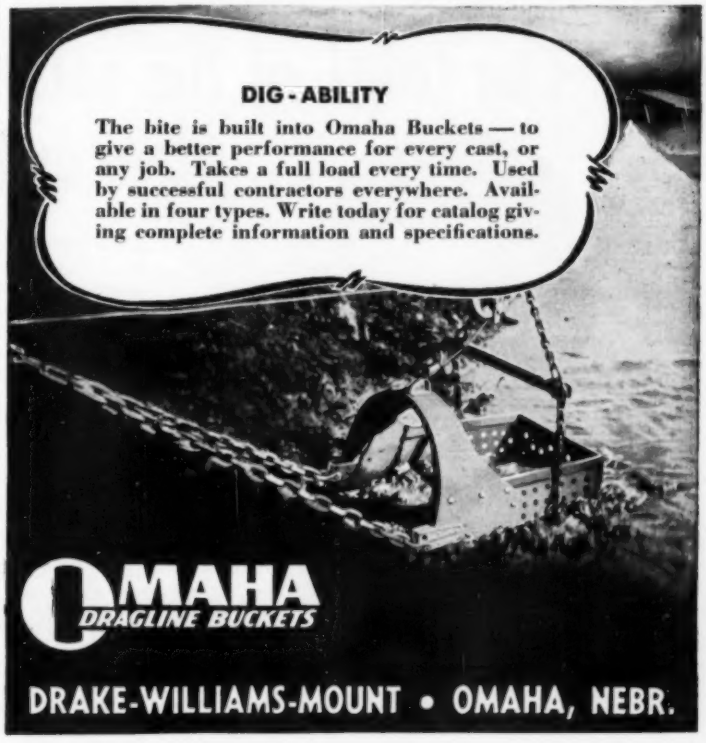
HYDRAULIC
DIPPER
CLAMSHELL

Bolted sectional steel hulls for landlocked, inland waters

If you need a dredge, write us!

AMERICAN STEEL DREDGE CO. INC.
FORT WAYNE 1 · INDIANA · U.S.A.

DESIGNERS AND BUILDERS OF DREDGING EQUIPMENT SINCE 1905


DIG-ABILITY
The bite is built into Omaha Buckets — to give a better performance for every cast, or any job. Takes a full load every time. Used by successful contractors everywhere. Available in four types. Write today for catalog giving complete information and specifications.
OMAHA
DRAGLINE BUCKETS
DRAKE-WILLIAMS-MOUNT • OMAHA, NEBR.

Notes from the manufacturers

Allis-Chalmers Manufacturing Co., Milwaukee, Wis., has appointed Henry M. Faulkner, district manager in the Allis-Chalmers eastern territory, to southwest industrial territory manager. Faulkner associated himself with Allis-Chalmers in 1939 working in the company's Atlanta branch. He served in the U. S. Army in the Pacific Theater from 1941 until he returned to the Atlanta branch office in 1947. Faulkner has held the positions of assistant industrial sales manager of the Atlanta branch and district manager of the Richmond, Va. district. He will now headquarter at the company's home office, Milwaukee, Wis.

Caterpillar Tractor Co., Peoria, Ill., announces that Harry H. Fair of San Francisco was elected chairman of the Board of Directors of Caterpillar Tractor Co. at a recent meeting of the board in San Francisco. He succeeds C. L. Best, who died in San Francisco the 22nd of September. Elected to the board to replace Best was A. H. Brawner, president of W. P. Fuller & Co., San Francisco, Pacific coast glass and wallpaper firm. Fair's connection with the tractor business dates back to 1918 when he became a stockholder and director of Best Tractor Co., one of the constituents of Caterpillar Tractor Co. He was instrumental in the formation of Caterpillar and has continuously been on its board and executive committee. Brawner is well known in the midwest for his World War II service with the army. Stationed in Chicago, Col. Brawner headed the labor branch of the 6th Service Command until his return to civilian life in November, 1945. A graduate of Princeton University, Class of 1921, Brawner started his work with W. P. Fuller & Co. the following year. For many years he handled labor relations and personnel matters for the company. Prior to August, 1942, when he entered the army, he had served variously as company treasurer, secretary-treasurer and vice president. He became president of the firm in January 1946. Among other activities in the San Francisco Bay region, Brawner is a director of Wells-Fargo Bank and Union Trust Co., California Pacific Title Insurance Co., Children's Hospital of San Francisco, and is president of the board of directors of Mills Memorial Hospital in San Mateo.

Cummins Engine Co., Inc., Columbus, Ind., is now selling and servicing its Diesel engine in eastern and central Iowa through Cummins Diesel Sales Corp., with headquarters at University and Illinois Sts., Des Moines. Territory for the new outlet will include these portions of Iowa, with the exception of Scott County. When announcing the opening of the Des Moines facilities, L. W. Beck, vice president — sales, said that the Des Moines installation will operate as a branch of the Omaha office. Omaha will continue to serve customers in western Iowa. Beck also said that James M. Gleason, former senior salesman at Chicago, has been named to the position of acting branch manager. L. H. Hanlon is in charge of the office and parts departments, and Joseph Boston heads the service department. The new dealership is located on state highway 60 and is near major truck line terminals and is also adjacent to the headquarters of many contracting companies. The shop has equipment for complete service work,

The total of the sale was a pleasant surprise!
says Don O. White, Independence, Mo.
More and more owners of construction equipment — like Mr. White — are finding that Forke Brothers' properly-conducted, well-advertised auctions bring best prices and immediate cash. Top prices from over the nation are brought to your location by interested buyers from the entire United States. All pieces, the largest and smallest, combine to bring you the highest total, more than any other method of selling.
Forke Brothers, in business since 1921, are pioneers in construction equipment auctions. Make certain you get their "Plan of Auction" before disposing of your equipment. Complete financing available, if desired. Write, wire or telephone.
FORKE BROTHERS
The Auctioneers
321 Sharp Bldg. Lincoln, Nebraska Phone 2-7045
EQUIPMENT AUCTION LEADERSHIP SINCE 1921

TO ADVERTISE: All advertising in this section is payable in advance. Rate: $1.00 per line, or $12.00 per inch of 12 lines. Minimum charge $4.00. No discounts; no commissions. Please count your copy carefully to avoid delay. Each line contains 41 characters (34 characters if all capital letters are used). Count spaces and punctuation as one character each. Allow 10 characters for box number, if blind advertisement is desired. Be sure to enclose the correct amount of money with your order. Closing date — 15th of preceding month. Example: January closes December 15th.

TO INQUIRE: Be sure to address your inquiry to the advertiser by using the correct box number. Mail your letter in care of Excavating Engineer, South Milwaukee, Wisconsin. Write each advertiser a separate letter. Do not write us for name and address of advertiser. This information will not be given out. We have no information about the equipment advertised other than that shown in the advertisements themselves.

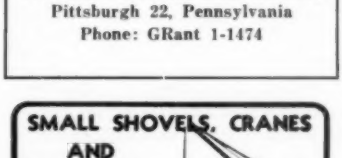
Bucyrus-Erie 320-B electric shovel, Serial No. 4957, mounted on Amsco shovel crawlers, operating on 4160 volts with Ward-Leonard control; Equipped with 75 ft. boom, 54 ft. dipper handle and 12 cu. yd. bucket. Machine can be seen in operation and is available May 15, 1952. Good condition. Write, wire or phone

The Pioneer Mining Corporation
Appleton City, Missouri

Two four-year-old Lima Model 750 draglines. Both equipped with 70 foot boom, 2¼ cubic yard Page bucket, Caterpillar D-17000 engine, and long crawlers. Both machines recently overhauled and in good condition.
Location, Oklahoma Box 3471

Immediate delivery P & H Model 1400 electric stripping shovel, guaranteed condition, 48 ft. boom, 34 ft. sticks, 3¾ yd. bucket, large inventory of parts.

Harmon Creek Coal Corporation
1606 First National Bank Building
Pittsburgh 22, Pennsylvania
Phone: GRant 1-1474



Northwest model 25; 6; 80D; 95. Manitowoc 6500; 4500 new — will rent. Bucyrus 54-B; Monighan 5W; 7W; 9W; 450.
A. W. Nevers Phone 32 Mt. Pleasant, Iowa

FOR SALE

15-B BUCYRUS-ERIE SHOVEL ATTACHMENT

Good Shape!

C. F. MALANKA & SONS, INC.
1317 Bergenline Ave. Union City, N. J.

Bucyrus-Erie GA-2 No. 9764 combination shovel and crane. In good condition. Contact

G. Beemsterboer
11732 South Yale Avenue Chicago, Illinois
Pullman 5-6000

Bucyrus-Erie Model 1030 crane with 65 foot boom and fairleads; 1-yd. capacity. Serial No. 10518, powered by Wisconsin Model B-3 gasoline engine. Power unit recently overhauled and otherwise rebuilt. Open to offer.
Box 3473

We Specialize
On Exclusively Used

mechanically sound, late model diesel Bucyrus-Erie and Northwest shovels, cranes, draglines and pullshovels. Our list of Bucyrus-Erie 15-B's, 22-B's, 38-B's and 54-B's and Northwest 25's, 6's, 80-D's and 95 machines is the most complete and comprehensive inventory of used machines of these models available. We also list walking draglines and all attachments.

J. C. French Company
226 Berry Parkway Park Ridge, Illinois
Tel. TAcott 3-4927

38-B 1948 1½-yd. Bucyrus-Erie w/Caterpillar diesel motor.
38-B 1948 shovel, 65 ft. crane boom, fairlead and counterweight, G.M. diesel.
Northwest 1949 Model 6, standard boom, stick, 1½-yd. Amsco manganese dipper, Murphy diesel engine; also backhoe with box boom, 2-yd. manganese dipper.
TD14, 1946, hydraulic angledozer blade.
Two Susser McLean scrapers, 10-12½ yds.
Backhoe attachment for Link Belt Speeder.
D8 bulldozer; pins, bushings, sprockets, idlers, new; hydraulic 2-drum power control unit, 1940.
Koehring 1947 Model 304 ¾-yd. shovel, backhoe and crane.
Peerless 4" deep well pump w/4-cyl. Wisconsin motor, new.
LP 12-15 yd. scraper.
Winch, 6-cyl. Hercules motor, new in crate, motor will fit ¾ yd. shovel.
Hughes-Keenan rear mounted crane for D7 w/hoister winch.
2-drum, 2-niggerhead cargo winches from ships; one new, one used; electric motors.
Manganese dipper fronts for 1½-yd. Lorain; also fronts, backs and doors for 2-yd. Northwest 1¼-yd. Link Belt; all new.
2-drum power control units for TD's 14 and 18.
The above equipment is our own, immediately available, subject to prior sale. If there is any equipment you need or want to sell, let us hear from you.

R. E. CUNNIFF
393 Brookline St., Newton Center 59, Mass.
Lasell 7-4300

7000 feet shielded preassembled aerial cable, 5 KV, 2-0, 3 conductor w/copper shielded tape; used but in good condition. Corona resisting rubber insulations. Box 3474

Locomotives, 7 to 80 tons, diesel, gas (7).
Crushers: 36x48, 18x36 jaw, 30" gyratory.
Orton locomotive crane, diesel, 40 tons.
Walking draglines, 3, 5, 7, 12 yds.
Euclid, Mack trucks, rear, 10 yds. & 32 tons.
Floating derricks, 65, 30 and 15 tons, steam.
Whirley portal gantry cranes, elec. (2).
Shovels, draglines, cranes, 1¼ to 10 yds. (9).
Diesel-elec. generator, Nordberg, 875 KW.
C-Bessemer 1000 HP diesel marine engs. (2), new.
Rotary dryers, 4', 4½', 7', 9'; to 170' long.
B-Erie shovel front att., 2¼-yd. 52B-55B.
H. Y. Smith Co., 828 N. B'way, Milw. 2, Wis.

IMMEDIATE DELIVERY

BUCYRUS-ERIE 44-B chain crowd shovel with 2 cu. yd. dipper; powered by Buda diesel engine and equipped with Kohler light plant. New set of tracks. Machine ready for work. F.O.B. New York. $15,000.
INTERNATIONAL Model TD9 tractor with Isaacson angledozer. 16 in. tracks completely reconditioned. F.O.B. Poughkeepsie, New York. $4750.
INTERNATIONAL TD18 tractor equipped with Bucyrus-Erie hydraulic bulldozer, completely rebuilt. $8000.

H. O. PENN MACHINERY CO., INC.
140th St. & East River New York 54, N. Y.
Telephone CYpress 2-4500

BUCYRUS-ERIE 60 FT. BOOM, DRUM WITH STEAM RAM & LEVERS TO CONVERT 41-B STEAM SHOVEL TO CRANE WORK.
DARIEN 60 E. 42nd ST. NEW YORK, N. Y.

HELP WANTED

Position vacant. Superintendent: Man familiar with open pit mining with bulldozer, scraper, shovel, for New Caledonia. Some knowledge of French preferred. Must be able to teach operators. Liberal pay and bonus. Box 3475

OFFICE ASSISTANT

Position available for a young man with two years or more of Engineering training and some field experience with excavating machinery. Duties will include the preparation of written copy for printed instruction books, also correspondence with field personnel. Technical writing experience helpful but not necessary. Position located in middle west. State age, experience and salary expected. Reply to Box 3476 in care of Excavating Engineer.

POSITIONS WANTED

Power shovel, backhoe and excavating equipment operator. A-1 mechanic, standard makes, Bucyrus-Erie preferred. Will go anywhere. Now located at Baltimore, Maryland. Box 3472

General superintendent or superintendent available; 30 years experience and qualifications: supervising, estimating, and building all types highways, airports, heavy excavating, large sewers, earth-filled dams, levies, covering several states. Honest, sober, and reliable, know cost and equipment. Interpret plans and organizing. Box 3464

If you are Buying or Selling Used Equipment this is the place to let the Excavating Industry know about it.

and will do fuel pump and in chassis overhauling. Six truck bays are included in the 45 x 80 foot building. A complete stock of parts also is available. There are presently more than 200 sales and service locations in the nationwide dealership organization.

Gar Wood Industries, Wayne, Mich. has appointed William H. McAllister district manager, Findlay division, for the Texas, Oklahoma and New Mexico territory. McAllister has been with the company since 1949, his last position being that of district manager in the Memphis territory. His successor at Memphis is Guilford E. Koehler. Koehler worked as a Gar Wood serviceman for more than nine years and has been a district manager for the Findlay division.

Frank G. Hough Co., Libertyville, Ill., has appointed Carl W. Tuohey as representative for Sales District Two, comprised of New York, New Jersey, Pennsylvania, Virginia, Delaware, West Virginia, and New England. Tuohey joined Hough June, 1950, and has had intensive training for his new duties. He is an engineering graduate of Purdue University. He will fill the vacancy created when William Cornell was recalled to active service with the marines.

Koehring Co., Milwaukee 16, Wis., at the annual meeting of the board of directors, elected J. R. Steelman president and E. A. Brugger vice president and general manager. In his new post, Steelman succeeds G. E. Long who will remain as chairman of the board of directors, a position he has held dually with the presidency up to this time. Steelman also will be elected president of each of Koehring's four subsidiary companies. Steelman's career in the construction industry started in 1929 with the American Bridge Co., in the drafting room and shop. He joined the TVA activity in 1934, devoting his time to construction plant design. In 1936 he became associated with the Koehring organization, serving first as sales manager for the C. S. Johnson Co., a subsidiary located in Champaign, Ill. He was named president of the Johnson Co. in 1941 and moved into the parent company as vice president in charge of sales in 1943. Brugger is a 35 year veteran with the company. After serving as assistant purchasing agent, during which time he organized the first production department, Brugger was named director of purchases in 1930 for the company and subsidiaries. He transferred to the Parsons Co., another subsidiary located in Newton, Ia., in 1938 and served as the firm's president and general manager for 10 years. Late in 1948 he returned to Koehring to become vice president in charge of production.

Le Roi Co., Milwaukee 14, Wis., has named T. O. Liebscher president. The company manufactures portable air compressors, tractor-compressors and rock drills for the construction and mining industry Liebscher joined the firm in April, 1940 as assistant secretary and assistant treasurer, then became secretary-treasurer. In 1946 he was elected to the board of directors and became executive vice president in 1950. Formerly he was staff supervisor for Peat, Marwick & Mitchell, an accounting firm in Milwaukee. As an indication of the company's growth during the past 12 years, sales volume for construction, mining, and engine division has progressed from 3 million to 19 million dollars. G. J. Hamm was appointed secretary-treasurer, C. W. Decker, assistant secretary, and J. R. Gavigan, assistant treasurer at the same meeting of the board of directors.

Pioneer Engineering Works, Minneapolis 13, Minn., subsidiary of Poor & Company, Chicago, recently acquired by purchase from Jaeger Machine Co., Columbus, O., its Model BP-5 bituminous paver. Through this acquisition, Pioneer secured the exclusive right to manufacture this paver under various patents. The new equipment will be built in the Minneapolis plant and will be distributed through authorized dealers in the United States, Canada, and throughout most of the world. By addition of the paver, Pioneer has rounded out its bituminous equipment line, formerly consisting of aggregate feeders, driers, gradation units, mixers, and dust collectors. Prior to acquisition of the Jaeger paver, the company could build all of the units used in the preparation of the bituminous paving material, but had no machine for laying the mix on the highway.

Rogers Brothers Corp., Albion, Pa., sponsored their first annual salesmen's school recently with 90 salesmen representing 22 states in attendance at the company's plant. In addition, two men were present from Toronto, Canada, and also the export distributor from New York representing all foreign countries excepting Canada. The purpose of the school was to educate salesmen in the field as to engineering design, and latest developments in Rogers trailers, and also competitive equipment. The group made a tour of the plant with guides explaining the operations in each of the departments. Particular interest was shown in the $50,000 shot blast building, and equipment which was put into operation in the spring of 1951. The company and salesmen felt that the effort was a success.

Warner & Swasey Co., Cleveland, O., named Irwin T. White sales manager of the Gradall division of the company. White, sales engineer in the Detroit district office of the company since 1946, has spent his entire business career with Warner & Swasey. Following graduation from the University of Wyoming in 1934, he became a special apprentice and served in both the Chicago and Buffalo district offices before the Detroit appointment. He is succeeded in the latter post by Robert L. Groves, presently sales engineer in Grand Rapids. A graduate of Harvard, Groves also joined the company as a special apprentice in 1940.

Detroit Diesel Engine Div., GMC, Detroit 28, Mich., has named ten sales engineers representing distributors of the division as leaders in the sale of engines in their respective zones for 1951. As winners of the annual W. T. Crowe award the men were brought to Detroit on the 13th of March where each was presented with a certificate of merit and a ring. The presentations were made by W. T. Crowe, general manager of the division at a dinner commemorating the occasion. The men honored and the companies they represent in the industrial, construction, petroleum, and marine fields throughout the country were announced by sales manager V. C. Genn, as follows: Vincent C. Giuliano, Griffin Equipment Corp., New York, N. Y.; Jules J. Janssen, Highway Equipment Co., Pittsburgh, Pa.; Lee Hardiman, Florida Diesel Engine Sales, Jacksonville, Fla; Herbert S. Matthews, George Engine Co., Harvey, La.; Robert W. Sime, Borchert-Ingersoll, Inc., St. Paul, Minn.; Robert Bowles, Jr., Western Machinery & Engine Co., St. Louis, Mo.; King D. Boyd, Stewart & Stevenson Services, Inc., Houston, Tex.; George A. Hefty, Mountain Tractor Co., Missoula, Mont.; Robert J. Hines, Anderson-O'Brien Co., Los Angeles, Calif.; and Walter W. Brydges, Evans Engine & Equipment Co., Seattle, Wash.

Cableway head tower, and tail tower across the canyon, are both driven on straight parallel tracks by G-E drives. Another set of towers for the service rig operates on the same tracks. Main cableway was built by Willamette Iron and Steel Co.

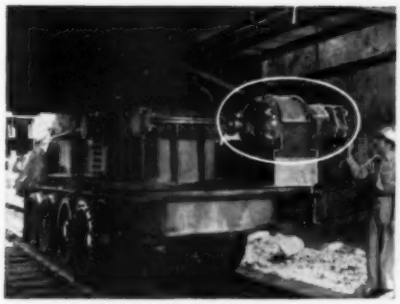
Cableway towers kept in line . . . electrically!

At Pine Flat Dam, G-E drives for movable head and tail towers prevent skewing, help keep pouring operations continuous!

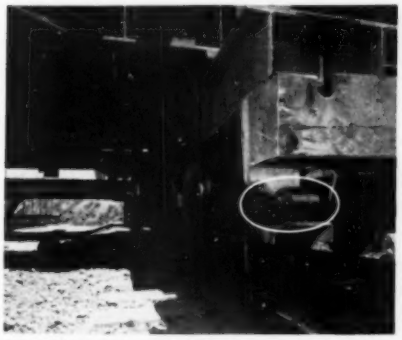
Here's an example of the versatility of electricity on construction jobs—a co-ordinated electric-drive system that helps keep an important project ahead of schedule. It's at Pine Flat Dam on Kings River in California, where a modern, high-speed G-E powered cableway—together with another rig for service functions—has set a pouring record of 4000 yards in one day.

All motors and control for the main cableway tower-drives on this Corps of Engineers dam, being built by Pine Flat Contractors Associated Companies, have been supplied by General Electric. In addition, the electric devices to keep the two cableways on the track, safely apart, and correctly aligned across the 2420-foot canyon, were all co-ordinated for the job by G-E application engineers.

This kind of engineering help—in application, installation, and service—regularly supplements G-E drives and power distribution systems, helps *you* get the most from *your* electrified construction equipment. *General Electric Co., Schenectady 5, N. Y.*



Under the head tower, this G-E 75-hp wound-rotor induction motor is one of two that drive the tower. Motors for head and tail towers are controlled by a single master switch in the operator's station.



Tower alignment is maintained automatically. This selsyn generator, connected to a head-tower wheel, and another on the tail tower, feed signals to a differential selsyn which controls speed of the tower-drive motors.

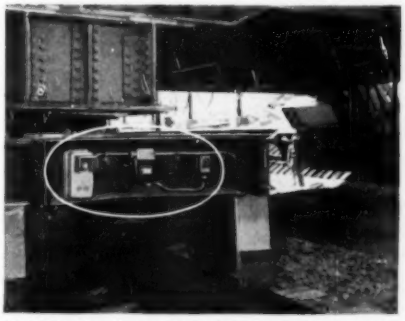


Photo-electric relays on each head tower automatically prevent the two rigs from colliding, and G-E limit switches keep towers from hitting stops at ends of the track. Thus operator can concentrate on spotting buckets.

Ask him today! **Whether you buy or build construction equipment, your G-E representative can show you how to do a better job—at lower cost—by complete electrification. Write him now, and he'll call on you at your convenience.**

GENERAL ELECTRIC

664-21

This New TRIPLE-THRIFT DRILLING COMBINATION

has no equal for speeding up construction jobs at rock bottom cost

1 GYRO-FLOW 600 ROTARY AIR COMPRESSOR

cuts operating and maintenance costs for air power

2 TWO FM-3 WAGON DRILLS,

served by one Gyro-Flow 600, save time and effort for drilling in any position

3 CARSET JACKBITS increase drilling speeds 50% or more—practically eliminate bit changes

THE NEW GYRO-FLOW 600 is the sensational new portable using a *rotary compressor*. Its advanced design—without valves, pistons or clutch—assures a new high in trouble-free performance with minimum attention and maintenance. "Air-Glide Capacity Control" gives smooth, step-less regulation over the entire capacity range. Matched to a powerful GM diesel engine, the Gyro-Flow 600 delivers full 600 cfm at 100 psi, yet weighs only 9500 lbs. ready to run.

THE NEW FM-3 WAGON DRILLS combine maximum drilling power and hole-cleaning ability with complete flexibility for drilling in any position. They handle 6-foot steel changes and drill holes up to 24 feet deep. The yoke is quickly raised or lowered by a powerful worm gear arrangement that is self-locking and slip-proof. The tower can be inclined at any desired angle and rotated at right angles to the carriage. Wheels can be turned 90° for line-holeing close to a wall.

CARSET JACKBITS, set with Carboloy inserts, have repeatedly proved their ability to out-drill steel bits by as much as 400 feet to one! They maintain uniformly high drilling speed for the full depth of the hole—reduce air consumption at least 40%—save wear and tear on drills and steels and practically eliminate bit changes. Gauge wear is negligible and uniform diameter holes save up to 30% on dynamite.

Be sure and ask for complete information.

Ingersoll-Rand

11 BROADWAY, NEW YORK 4, N. Y.

6955

ROCK DRILLS • COMPRESSORS • AIR TOOLS • CENTRIFUGAL PUMPS • TURBO BLOWERS • CONDENSERS • DIESELS • GAS ENGINES